

Sale of State Shares in Iceland Telecom

Report

**The Executive Committee on Privatisation
April 2005**

**Privatisation of and Sale of State Shares in Iceland Telecom hf.
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Summary of conclusions

Iceland Telecom's position in the Icelandic telecommunications market

Iceland Telecom will be a century old in 2006. It is one of the oldest companies to have been owned by the Icelandic State Treasury as well as one of the largest. The company's operations are extensive and diverse in the field of telecommunications and information technology, and it has recently made a foray into television content distribution – a trend seen lately in Iceland and many parts of the world. Most European telecommunications enterprises have been privatised in one way or another. The Icelandic Government has found it imperative to reduce the scope of government enterprises, since competition in the telecommunications sector has become more intense and robust than ever. In order to ensure effective competition, however, the legal framework must be clear and regulation must be active, in keeping with modern requirements.

Legal framework

The report prepared by the Executive Committee on Privatisation during the run-up to the sale of State shares in the company in 2001 contained a detailed discussion of the Government's policy on the telecommunications sector. It referred to, inter alia, the 1999 Telecommunications Act in force at the time. In 2003, a new Telecommunications Act took effect. Its objective is the same as that of former telecommunications legislation, i.e. to ensure cost-efficient and secure telecommunications in Iceland and encourage effective competition in the telecommunications market. It stipulates that the Icelandic State shall ensure, as far as possible, that all Icelanders have access to telecommunications services, as provided for in detail in the Act. Perhaps the most significant change is that an operating licence is no longer required to engage in telecommunications operations, in place of which telecommunications companies are now to operate under general authorisations. In addition, the rules of competition law are applied to assess whether a company has significant market power, corresponding to a dominant position, rather than using a market share of 25% as a benchmark, as in the previous law. The new Act also places a strong emphasis on equalising the operating conditions of telecommunications companies and ensuring competitive conditions, and to this end highlights the role of the Post and Telecom Administration and the Competition Authority.

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In its 2001 report, the Executive Committee on Privatisation found it important to make a decision as soon as possible on the arrangement for allocating operating licences for third-generation mobile telephony services. In deciding on a methodology, the Committee regarded it as most important to promote effective competition, extensive coverage, inexpensive services and quality. The Act on Third-Generation Mobile Telephony was passed in February 2005. This Act had been awaited for some time, although development in this field has been slower than expected. Unlike what had happened in many other countries, Icelandic telecommunications companies had not spent very substantial funds on obtaining licences for such services, although frequencies for transmission using this technology are limited. Third-generation data-transmission capacity is much greater than in the current mobile telephony network, which will enable operators to offer much more extensive services than presently

known. The third generation of mobile phones will create a service market offering new technologies and methods in business communication, which can be expected to have a generally positive effect on the economy. Rights to operate third-generation mobile phone services and their diffusion can also be expected to step up competition in the mobile-phone market.

On the possible separation of the Basic Grid from Iceland Telecom

During the preparation of the sale process about to start, as in the period leading up to the sale process four years ago, there has been substantial discussion about whether to separate the *Basic Grid*, i.e. basic telecommunications infrastructure, from Iceland Telecom. In its former report, the Executive Committee on Privatisation came to the conclusion that this would not be feasible. In the run-up to the forthcoming sale process, the Committee has not seen changes regarding its grounds for this position justifying its review. Nonetheless, the Committee found it important to obtain expert opinion on this issue. Chapter 4 of this report contains a report by the IT and telecommunications consultancy firm Admon ehf. on the technical aspects of the Basic Grid.

Admon's report endeavours to define the term Basic Grid. In the Committee's opinion, a convincing attempt at such a definition has been very much lacking in recent general discussion. The report presents different definitions of the Basic Grid and basic-grid services, without accentuating or giving more legitimacy to any one of them. The conclusion remains that separating the Basic Grid from Iceland Telecom is not feasible, and the Committee finds, with reference to Admon's report, that more and stronger arguments now support this view. The uncertainty of such an arrangement would be substantial, its cost massive and it would provide negligible assurance of equalising competitive conditions further than already ensured by telecommunications and competition law.

It is found prudent to emphasise the current methodology of controlling and regulating the telecommunications market and the activities of telecommunications enterprises, as applies to other companies in competition. This is consistent with other competitive markets in Iceland and the framework for such markets in our neighbouring countries. If control and regulation need to be strengthened, it is important for this to be effected in conformity with EU legislation and directives. However, support is added to the view that regulatory bodies must be equipped to respond to complaints effectively in order for decisions to be rendered as soon as possible, as telecommunications technology changes frequently and telecommunications services develop rapidly.

Proposed sale procedure

The Executive Committee on Privatisation proposes that all State shares in Iceland Telecom be sold in a single lot to one consortium of core investors. However, the Committee proposes that such a sale to a core investor be subject to the following conditions:

- a) no single party, related or connected parties shall acquire a share in Iceland Telecom, or a company established for the purchase of the State's share in Iceland Telecom, larger than 45%, directly or indirectly, until the company's listing on the Main List of the Iceland Stock Exchange.
- b) a specified portion of the purchased shares, and no less than 30% of the company's total share capital, shall be offered by the buyer to the general public

and other investors for purchase before year-end 2007, and the sale of shares in the company to other parties shall not take place until such a sale is complete.

- c) Iceland Telecom shall be listed on the Main List of the Iceland Stock Exchange (ICEX), in accordance with the conditions of ICEX, concurrently with the sale to the public and other investors, and redemption rights shall not be exercised vis-à-vis current shareholders in Iceland Telecom (1,2 %) until the listing of the company on the ICEX Main List.
- d) the core investor shall not have direct or indirect holdings in companies competing with Iceland Telecom in Iceland.

The assessment of bids will be based on, *inter alia*, price, financial strength and financing plans, experience of business operations and ideas and future vision regarding Iceland Telecom's operations, its employees and services in urban and rural areas during the next five years and other relevant factors.

It is proposed that the sale take place in the early summer.

Morgan Stanley in London acts as a financial advisor to the Executive Committee on Privatisation.

1. Introduction

At year-start 2001, in the run-up to the then-intended sale of the Treasury's shares in Iceland Telecom hf., the Executive Committee on Privatisation issued a report. During the autumn of that same year, preparations began on implementing the aspects of the sale already formulated by the Committee, by way of an initial widespread sale of a 24% share to the public, staff and smaller investors, and some time subsequently, the sale of a 25% share to a core investor. As is known, the objectives set by the Committee for the sale were not achieved, and in a joint press release on 1 March 2002 the Committee and the Ministry of Communications announced the decision to postpone the sale for an indefinite period. Extensive preparations had been ongoing since year-start 2000, when the Minister of Communications entrusted the Committee with making proposals on how to implement the sale, and the sale period itself had been in progress for almost six months.

An extensive report on the sale process was written and published, e.g. on the Committee's website, on the same day that the said press release was issued.¹ A legal opinion was also published on whether the State had an obligation to offer to other shareholders in Iceland Telecom redemption of their shares in light of the fact that the State's plans to sell the shares in the stages envisaged and presented in Iceland Telecom's Prospectus would not materialise.²

The reasons for bringing the sale process to an end were manifold, as discussed in the report, and need no repetition here. It is worth noting, however, that the National Audit Office made a separate assessment of the sale process in a report published in 2003³ titled *The Privatisation of Major State Enterprises in 1998-2003*. The Office's conclusion was that there was no pressing need for the State to sell Iceland Telecom at a price lower than what it found acceptable, and that therefore its decision to discontinue the sale process was normal under the circumstances.

The press release issued on 1 March 2002 clearly stated that the Government's policy was unchanged; its intention remained to sell all shares in Iceland Telecom to private parties. The sale of the State's interest would thus be resumed as soon as conditions in the financial market permitted, and as soon as investor interest in acquiring stocks in Iceland Telecom was revived.

In light of the external conditions at the time, which sent all main stock markets plummeting, including the Iceland Stock Exchange, the Committee finds that its decision to postpone the sale was the right one. Later developments confirm this opinion. Iceland Telecom has gained much strength since, as have stock markets in Iceland and overseas. The present conditions for sale, in the first half of 2005, are on the whole favourable in expert opinion, unlike in the autumn of 2001.

¹ <http://www.forsaetisraduneyti.is/media/Einkavaeding/reportENS2002.pdf>

² <http://www.forsaetisraduneyti.is/raduneyti/verkefni/Einkavaeding/nr/246> (in Icelandic)

³ http://www.rikisend.is/files/skyrslur_2003/einkavaeding.pdf; see English summary at http://www.rikisend.is/index.php?module=news&action=show&news_id=12&language=en

But it is not only the company and financial market conditions that have gained strength. The same applies to the telecommunications market as a whole. The Icelandic telecommunications market has seen much change in the most recent years. A number of Iceland Telecom's competitors three years ago, Íslandssími, Tal and Halló – frjáls fjarskipti, have merged into one large rival: Og fjarskipti. Og fjarskipti's competition with Iceland Telecom is mainly in fixed-line voice and mobile telephony. In addition, a number of new companies have added competition in broadband and basic-grid services. Several venture firms, either planning to or already offering niche telecommunications services, have also emerged.

In view of the above, the Committee finds that there is now – more than at any previous time – a pressing reason for Iceland Telecom, as a participant in an ever-changing and complex competitive market, to be transferred from State hands to private ones. The same opinion is expressed in a recent OECD annual review on the Icelandic economy,⁴ which advises that Iceland Telecom's sale be finalised as soon as possible.

1.1 Formulating a new sale procedure

The post re-election Policy Statement of the present coalition government, presented in May 2003, contains a pledge to follow through the parliamentary authorisation for the sale of the State's share in Iceland Telecom. It also states that care shall be taken to arrange the sale under favourable market conditions to ensure that the Treasury obtains a fair price for this asset, and that current services to the public in this field shall not be compromised.

Market conditions can be said to have improved already by the autumn of 2003. The Executive Committee on Privatisation has since been preparing a new sale process. This preparation has focused primarily on obtaining a professional consultancy service to the Committee, a valuation of the company and a new due diligence exercise. Much of the preparation carried out between 2000 and 2001 proved useful to the Committee in preparing the new process. However, the current preparations and the intended sale procedure differ from the former in four fundamental ways:

First, the Government decided to transfer the formal ownership of the State's shares in Iceland Telecom from the Ministry of Communications to the Ministry of Finance. A legislative act to this effect was passed in the autumn of 2003 and took effect on 1 January 2004. Reasoning for this arrangement was provided in, e.g., the comments on the bill for this act. These comments include that the Ministry of Communications had charge of the State's holding in Iceland Telecom, cf. the Transitional Provisions of Act No. 75/2001 on the Sale of the Treasury's Shares in Iceland Telecom. The comments state further that this entailed a deviation from the structure generally applying to the treatment of such assets, as the Regulation on the Government Offices of Iceland No. 96/1969, cf. the Public Notice on its approval, stipulates that the Ministry of Finance shall have charge of matters relating to the State's assets, including shares and other securities. "The Government had, with reference to this provision, decided that the Minister of Finance should take over responsibility for the State's shares in Iceland Telecom from the Minister of Communications, as, in light of the company's area of business, responsibility for the shares by the same Minister that has charge of telephony and other telecommunications matters can be disadvantageous."

⁴ OECD, 2005 Annual Review – Iceland.

Second, the Executive Committee on Privatisation decided not to propose a sale procedure or a possible division of the sale into parts until having received the opinion of the consultancy firm selected by the Committee: the financial services company Morgan Stanley in London. Thus, an effort has been made to ensure that the decision on the sale procedure is based on the most professional grounds possible. Account is taken of the advice of analysts of the Icelandic and international financial markets, and the final decision on the sale procedure is taken at a point in time close to the start of the sale.

Third, the Annual General Meeting of Iceland Telecom held on 23 February 2005 passed the Board of Directors' motion to pay a higher dividend than usual, or 90% of the nominal value of shareholders' equity instead of 30%, which had been the pay-out ratio for years. As a result, dividends to shareholders totalled over ISK 6.3 billion, instead of ISK 2.1 billion as in the preceding three years, reducing the company's equity ratio from 59% to 46%. This decision was based on the view that a higher total price would thus be drawn for the company than if it were sold with the high equity ratio that was previously the case. It should be noted that a 59% equity ratio was among the highest known among European telecommunications companies, while the current ratio is still above the average for European telecommunications enterprises.

Fourth and last, Iceland Telecom is now subject to rules governing companies listed on a regulated stock market, but was listed on the Alternative Market, an OTC market on the Iceland Stock Exchange (ICEX), when the public and the Iceland Telecom staff were offered the option to buy shares in the company in September 2001. The Committee has taken this into account in preparing the new sale process.

1.2 Activities of the Executive Committee on Privatisation

The Executive Committee on Privatisation is composed of Jón Sveinsson, Supreme Court attorney, and chairman of the Committee, Baldur Guðlaugsson, Permanent Secretary, Sævar Þór Sigurgeirsson, state-authorized public accountant, and Illugi Gunnarsson, Political Adviser to the Minister for Foreign Affairs. Mr Gunnarsson took the seat on the Committee vacated by Ólafur Davíðsson in September 2004. The Committee's staff consists of Stefán Jón Friðriksson, Head of Division at the Ministry of Finance, and Jörundur Valtýsson, Head of Division at the Prime Minister's Office.

In its work and preparation of this report, the Committee has enjoyed excellent co-operation with the Ministry of Communications, as well as with the Post and Telecom Administration and Iceland Telecom for information regarding technical aspects and the company's general operations. The Committee has had useful meetings with representatives of the Competition Authority, the Iceland Stock Exchange and a number of commercial banks and financial institutions, specifically Landsbanki Íslands hf., Íslandsbanki hf., Kaupthing Bank hf., MP Investment Bank hf. and VBS Securities hf. In addition, the Committee has obtained expert legal opinion, oral and written, on various matters, including redemption requirements, from Professor Jóhannes Sigurðsson and Sigurður T. Magnússon, District Court attorney, both of whom are faculty members at the Reykjavík University School of Law.

The Committee's main consultant is Morgan Stanley Ltd in London. Morgan Stanley has provided general advice and made proposals regarding the procedure for selling the State's shares in Iceland Telecom, and the Committee has taken due account of this advice. Morgan Stanley will continue to assist the Committee in the sale process itself. The financial services

company PricewaterhouseCoopers in Iceland, in collaboration with the law firm Landwell, has carried out a due diligence exercise, and ParX Business Consulting, an IBM Business Partner in Iceland, has performed a benchmark valuation and various other financial analysis for the Committee. In addition, the IT and telecommunications consultancy firm Admon ehf. contributed to this report, and has provided the Committee with various advice on technical matters. The Committee's co-operation with the above parties has been concerted, professional and targeted.

1.3 Report's purpose, structure and focus areas

This report is written in a manner similar to the former report issued in January 2001, and its content is structured in the same way in all main respects. However, various changes have taken place for Iceland Telecom and its operating environment since 2001, and an effort is made to outline these changes. The report's main purpose is to describe the company, its activities and operating environment, the telecommunications market and its legal and technical framework at the turning point at which the State divests itself of the company after nearly 100 years of ownership. The report is meant to be equally accessible to the general public and prospective investors in the company.

The report is structured in the following manner: the present chapter has already described the events leading up to the sale process now started as well as the Executive Committee's preparations.

Chapter 2 deals with Iceland Telecom's internal organisation, technical infrastructure and assets, service range and competitive environment in the Icelandic market, and compares the Icelandic telecommunications market with overseas markets.

Chapter 3 discusses the legal framework of telecommunications companies in Iceland. Particular emphasis is placed on shedding light on how the 2003 telecommunications legislation and related regulations are intended to promote a healthy and strong competitive environment for the Icelandic telecommunications market. The roles of regulatory authorities in this field, i.e. the Post and Telecom Administration and the Competition Authority, are also dealt with, including how they are meant to ensure that these same objectives are achieved.

Before the intended sale of shares in Iceland Telecom in 2000-2001, a detailed discussion took place regarding the possible split-up of the company and the separation of the Basic Grid from Iceland Telecom. In brief, the Committee's conclusion was categorical: it was not found prudent, whether from a technical or business standpoint, to separate the Basic Grid from Iceland Telecom. This conclusion was based on, among other things, experts' opinion at the time as well as the experience of other countries. A detailed but fairly theoretical account of this view was included in the Committee's former report. In the run-up to the forthcoming sale process, the Committee found it necessary to examine whether any changes had taken place calling for a reconsideration of its conclusion from 2001.

This matter is dealt with in Chapter 4 hereof. Expert opinion was obtained from the consultancy firm Admon, which wrote a report on this issue. Admon's approach differs from the previous report on this matter, while presenting the advantages and disadvantages of dividing up the company in a thorough and professional manner.

The fifth and last chapter presents the Committee's proposals for the manner in which the sale of the Treasury's shares in Iceland Telecom should proceed. It provides an account of the grounds on which the Committee's proposal is based as well as the terms and conditions of the sale.

2. Iceland Telecom hf.

2.1 Organisation

The operations of Iceland Telecom have seen much change in the past few years. Formerly run in a monopoly framework, it has been incorporated into a limited liability company operating in an ever-stiffening competitive environment. Although the intended sale of the Icelandic State’s shares in Iceland Telecom at year-end 2001 did not come to fruition, plans to privatise Iceland Telecom have had a substantial effect on the company’s activities. A new President and CEO took over in mid-2002, and at year-start 2003 the company’s organisation chart was revamped as part of an ongoing effort to make Iceland Telecom better able to take on challenges in its constantly changing business environment.

2.1.1 Management structure

Iceland Telecom’s new organisation chart is divided into profit centres and support units. The objective of the restructuring in 2003 was to strengthen the company’s profitability and competitiveness. This was done by ensuring a clear division between units and that powers and responsibilities always go hand in hand, as well as by raising cost awareness within the company.

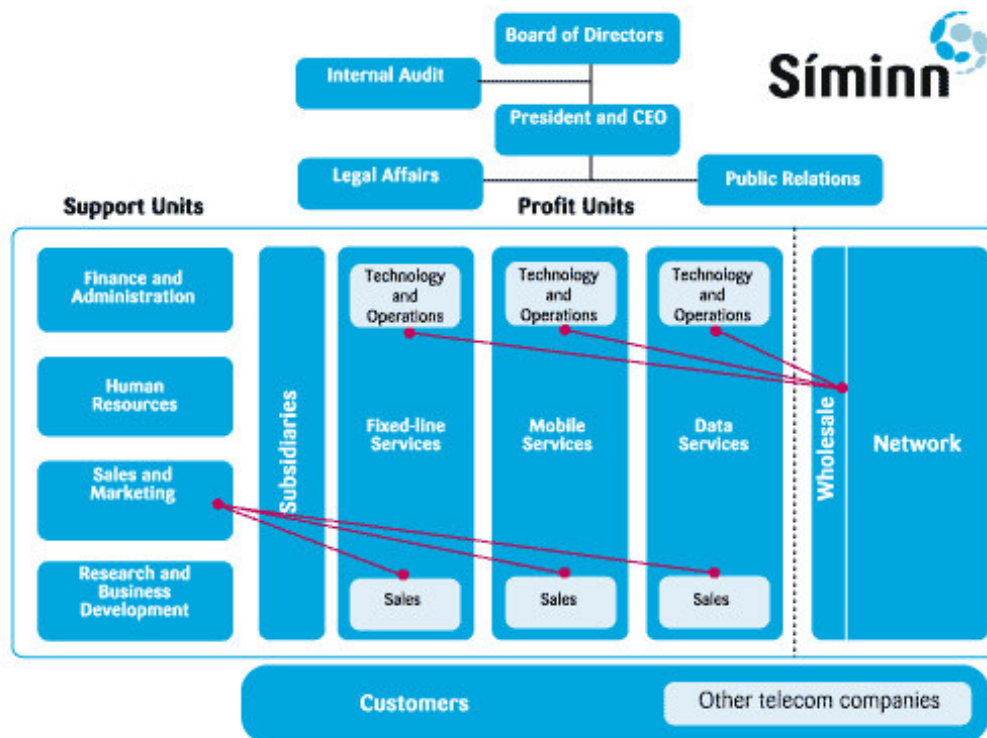


Figure 2-1 Organisation chart of Iceland Telecom presented in January 2003

The support units are Finance and Administration, Sales and Marketing, Human Resources, Research and Business Development and Legal Affairs (the last one dating from March 2004). These units support and provide services to the core operations of the profit centres. Sales and Marketing co-ordinates marketing activities and provides expert services, in addition to operating Iceland Telecom's retail outlets and service centres. Research and Business Development focuses on product development and innovation as well as seeking out new business opportunities well-matched with the company's main activities. Legal Affairs has responsibility for ensuring the company's compliance with laws and regulations.

The profit centres are divided into Fixed-Line Services, Mobile Services, Data Services and Network. The profit centres have authority and responsibility for investment, development and sales and marketing of their own products and services. The profit centres are separate operating units receiving services from the support units. The figure below shows the external operating revenues of the profit centres in addition to other operating revenues of Iceland Telecom and its subsidiaries. However, it does not show internal operating revenues, which are substantial, for example in the case of Network's sales to Iceland Telecom's other profit centres.

Legal Affairs and Public Relations come directly under the CEO.

The senior managers of support units, profit centres, Legal Affairs and Public Relations sit on Iceland Telecom's Executive Board together with the CEO.

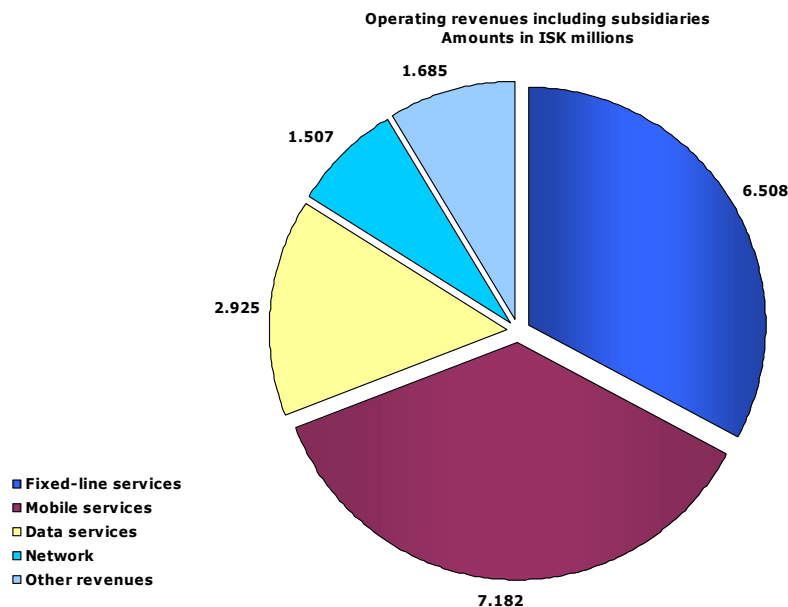


Figure 2-2 Break-up of operating revenues of Iceland Telecom and its subsidiaries in 2004

2.1.2 Divisions

2.1.2.1 Internal Audit

The role of Internal Audit is to provide objective opinion and advice on Iceland Telecom's activities, aiming to increase the company's value and improve its operations. The division focuses on strengthening risk management and surveillance activities. Internal Audit's key focus is on assessing whether internal controls in Iceland Telecom's day-to-day operations are adequate to ensure:

- compliance with laws and regulations
- satisfactory dissemination of information to management
- adequate risk analysis and risk management
- achievement of goals and plans
- a continuous quality-and-improvement programme integrated with Iceland Telecom's normal operations
- that important information is accurate, reliable and appropriate
- that employee actions conform to Iceland Telecom's policies and procedures
- that value is safeguarded, utilised and obtained in the most cost-effective manner possible.

2.1.2.2 Legal Affairs

The main responsibilities of Legal Affairs are:

- to provide professional legal advice
- negotiating agreements and contracts
- management and follow-up on legal proceedings
- answering external queries
- correspondence with competitors and other businesses
- ensuring the company's compliance with laws and regulations regarding the company.

2.1.2.3 Public Relations

The main function of Public Relations is to disseminate information about Iceland Telecom's operations to the general public, the media and government, as well as internally to the company's staff. An emphasis is placed on promoting a positive image for Iceland Telecom and highlighting the company's importance to the information society. Public Relations assists various business units and the company as a whole in the promotion and marketing of services, image design and crisis management.

2.1.2.4 Finance and Administration

The role of Finance and Administration is to provide support to profit centres and support units. This division formulates strategy and manages Iceland Telecom's finances, including treasury, collection, accounting, budget planning and analysis as well as revenue monitoring. Quality management, procurement, central IT and real-estate and vehicle management also come under its remit. It emphasises effective analysis and dissemination of information from

the company's operations and the telecommunications market as a whole, as well as promoting progress and best practice to the benefit of each company department.

2.1.2.5 Human Resources

Iceland Telecom has a staff of approximately 1,170. Ever since Iceland Telecom was incorporated in 1998, there has been much renewal in its workforce, with the average age of staff dropping from just over 45 years to just under 40. The company has operations at 21 locations in Iceland. There is substantial competing demand for staff in the telecommunications and IT sector, and market salaries have risen, which translates into higher payroll costs and more diverse salary arrangements, including bonus payments.

In order to enable staff to take on a changed competitive business environment, Iceland Telecom has stressed targeted staff development and vocational retraining, particularly for management staff. Work is also ongoing to implement a performance system based on staff interviews, service standards and systematic measurements emphasising continual feedback.

2.1.2.6 Sales and Marketing

The mission of Sales and Marketing is to strengthen and maintain the corporate image that Iceland Telecom has constructed for itself in the market, as well as promote the company's individual services, aiming to retain and win customers. With its increased focus on target-groups analysis, the company is better equipped to meet customer requirements through tailored solutions and a service range based on customer needs and expectations. Iceland Telecom is primarily a solid service telecoms company offering its clients a one-stop shop. It strives to be at the forefront in telecommunications solutions, and continually offers its customers innovative products and total solutions aiming to meet client needs at any given time in the best way possible.

2.1.2.7 Research and Business Development

Research and Business Development was established when Iceland Telecom's new organisation chart was introduced at year-start 2003. This division's role is to promote progress, knowledge and new opportunities for Iceland Telecom. It formulates company strategy and works across the Group in order to integrate separate divisions and subsidiaries with the company's future plans. The division emphasises possessing and disseminating knowledge on world trends in telecommunications as well as seeking out new technical solutions and revenues to counteract stagnating revenues from conventional services. In addition, Research and Business Development supports the company's profit centres in designing and implementing new products and business opportunities.

2.1.2.8 Subsidiaries

Iceland Telecom's organisation chart contains a separate profit centre for its subsidiaries and affiliates. Research and Business Development is responsible for this unit, including administration and control regarding Iceland Telecom's assets in subsidiaries and affiliates. It works towards ensuring that Iceland Telecom's interest in these companies is safeguarded in co-operation with the Directors appointed by Iceland Telecom to the boards of these companies, where applicable. The division as a whole endeavours to integrate the strategies of subsidiaries and affiliates with Iceland Telecom's internal development issues in order to prevent unnecessary duplication or shortage of know-how within the Group.

2.1.2.9 Fixed-Line Services

Fixed-Line Services has responsibility for the development, renewal, operation and maintenance of equipment for selling and providing fixed-line telephone services. It is also responsible for the sale of telephone service as well as product development and value-adding services. Fixed-Line Services' main selling product is fixed-line voice service via the company's telecommunications network in addition to specialised solutions such as ISDN, Centrex and the Intelligent Network.

The business units of Fixed-Line Services are Switching Systems and Sales and Product Management. Switching Systems supervises all installations, modifications and connections of switching systems as well as maintenance, whether tendered or performed by its own team. It also has charge of the day-to-day running, monitoring and servicing of the switching network, in addition to related tasks. It is responsible for the operation of public-pay telephones, under the company's universal-service obligations. Sales and Product Management handles the sales and marketing of the division's products and services in co-operation with Sales and Marketing division. It employs product managers whose responsibilities include sales and marketing projects. The department also operates the Fixed-Line Service Desk, which services its products, mainly Centrex.

2.1.2.10 Mobile Services

Mobile Services has responsibility for the development, renewal, operation and maintenance of equipment in order to sell and provide mobile telephony services. It also has charge of the sale of mobile-telephony service as well as product development and value-adding services. The main selling products of Mobile Services are GSM, GPRS, NMT and satellite phone, in addition to related value-adding services.

The main business units of Mobile Services are Technical Solutions and Sales and Product Management. Technical Solutions supervises all installations, modifications and connections of mobile phone stations and distribution systems as well as maintenance, whether tendered or performed by its own team. It also has charge of the day-to-day operation, surveillance and services of the switching and distribution network, in addition to related tasks. Sales and Product Management handles sales and marketing activities in co-operation with the Sales and Marketing division. The department employs product managers whose responsibilities include sales and marketing projects.

2.1.2.11 Data Services

Data Services is a separate profit centre, and is responsible for the operation of data-transmission services, Internet services and Iceland Telecom's TV distribution services. Data Services is divided into two departments: Technical Solutions and Sales and Product Management. Technical Solutions administers the development, operation and servicing of Iceland Telecom's data-transmission and TV systems. Sales and Product Management has responsibility for the performance of Data Services' product range, and has the objective of maximising the profit margins of the division's products and solutions. The department oversees various activities relating to Data Service's products, whether in the field of development, marketing, sales, invoicing, delivery or service.

Data Services has established itself as an innovative leader in the data-transmission, Internet and TV market. For example, Iceland Telecom was the first to roll out ADSL services, MPLS services, digital TV and TV over ADSL.

2.1.2.12 Network

The Network division operates a separate Wholesale department responsible for the wholesale of Network's services to other telecommunications companies as well as to other Iceland Telecom intra-company profit centres. The Wholesale department comes under a separate board that decides the service's pricing in accordance with the provisions of telecommunications legislation.

2.1.2.13 Research and development

The main goals of Iceland Telecom's research and development activities are to create new knowledge and maintain existing knowledge. Iceland Telecom has taken active part in Icelandic and international research projects since 1994. Much of this activity has been based on co-operation with external parties, such as universities, public bodies, telecommunications companies and other businesses. Such co-operation has been fostered mostly under the auspices of the European Institute for Research and Strategic Studies (Eurescom), EU framework programmes and the Icelandic Research Council (Rannís). The multiplying effect of this research work is substantial, with results multiplying compared to what would be attained by each party working separately on the projects.

Iceland Telecom has taken part in numerous research projects in various fields, including access networks, TV distribution, IP network technology, wireless telecommunications and home networks. Its focus is also on projects relating to the use of IT and telecommunications technology to develop new services. In this area, projects have been undertaken in relation to, for example, teleworking, education, virtual communities and human-resource management. The near future holds substantial opportunities in supplying new services, which telecommunications companies can take advantage of by engaging in powerful research and development, both in technology and services.

2.1.3 New brand focus

2.1.3.1 Branding

Following Iceland Telecom's re-organisation, the decision was made to undergo a *branding* process in order to sharpen the company's image and future vision. The branding project was carried out in collaboration with the Swiss-based Young & Rubicam Business Consultants. The primary reasons for engaging in this extensive work were Iceland Telecom's substantially changed competitive environment and the need to sharpen the company's brand focus.

2.1.3.2 Iceland Telecom's Octagon

The methodology used by Young & Rubicam's consultants is named Octagon. The Octagon tool focuses attention on future vision, target groups, promises, goals, services, personality, brand name and, not least, market placement. The branding project included reviewing all of these aspects in the company's activities.

2.1.3.3 Future vision

Iceland Telecom's future vision is based on the results of the branding project. The future vision is: *Iceland Telecom leads you into the future*. Iceland Telecom leads the customer into

an open future society with unrestricted and infinite possibilities in communications. Through expert knowledge, initiative and understanding customer needs, clients will be provided with tailor-made services.

2.1.3.4 Values

The future vision influences the values that Iceland Telecom stands for, which shape its corporate culture. Trust and integrity remain core values, and are firmly rooted in Iceland Telecom's culture. Other Iceland Telecom values include agility, simplicity and passion.

2.1.3.5 Market placement

Iceland Telecom affects the lives of all Icelanders every day, and is regarded as one of the country's most reliable companies. It is not only a telecommunications operator, but also provides its customers with entertainment in the form of communicative interaction, computer games and TV broadcasting. The conclusion for Iceland Telecom's market placement is: *Iceland Telecom enriches life.*

2.1.3.6 Lifestyle groups

Iceland Telecom views its customers through conventional division of target groups into companies and individuals. Individuals are then looked at based on their perceptions and motivations, by lifestyle and values. Product and service development is founded on these groups' needs. Iceland Telecom is probably the world's first telecommunications company to use this taxonomy. Personality types are classified by the following five keywords: explorer, reformer, succeder, establishment and aspirer. Individuals are profiled by the goals and desires to which they give priority. Iceland Telecom has had a market study performed on the distribution of Icelanders between these groups, so the proportion of each group is known. These data are employed in the company's marketing efforts.

2.1.3.7 Corporate promise

One of Iceland Telecom's key strengths, and what separates it from its competitors, is that it offers a total range of all telecommunications products and services. Thus, Iceland Telecom's main promise to its customers is to be a one-stop shop, maintaining its edge in customer services.

2.1.3.8 Name and logo

The project's results included the finding that Iceland Telecom's name (*Síminn*) has very substantial value as one of the five best-known brands in Iceland. Therefore, the decision was made to keep this name. However, a new logo was designed reflecting the company's future vision and market placement. The new logo is designed in smooth and simple curves forming the letter S. It suggests a stylised three-dimensional drawing of a globe, thereby carrying an outward-looking, international connotation. The logo also depicts two links in a chain twisting around each other, signifying any type of communication. The form is modern and organic to underline the company's new image. Its colours are based on Iceland Telecom's tradition, but are lighter, fresher and more forward-looking.

2.2 Infrastructure and assets

2.2.1 Telecommunications infrastructure

Iceland Telecom's telecommunications infrastructure has been developed in the same manner as equivalent infrastructures in Iceland's neighbouring countries. Development in Iceland has

usually been more rapid than overseas, and an emphasis has been placed on serving all Icelanders. Accordingly, the public telephone network was, for example, completely digitised earlier in Iceland than in other countries.

2.2.1.1 Cables

Iceland Telecom's access network and trunk network are large in scope, covering nearly every building and community in Iceland. During the past two decades, the company has spent substantial funds on enhancing its copper, fibre-optic and microwave network. Its network easily accommodates fixed-line telephony, mobile telephony, data transmission and TV and radio broadcasting services.

Most places in Iceland are now connected to the network via two separate channels through fibre-optic or microwave connections, and the system switches automatically between channels if either is disconnected. In 2004, much work was undertaken to replace and renew older transmission channels throughout the entire country. The transmission capacity of the fibre-optic circle's northern route was increased following the advent of the FARICE-1 submarine transmission cable, and the route now has virtually unlimited data-carrying capacity. This year, Iceland Telecom will increase the southern route's capacity from the town of Hvalsöllum to Egilsstaðir in the East Fjords, which will mean virtually unlimited capacity all around the country.

A fibre-optic cable around the country and in nearly every urban area creates a very strong position for the company to provide new services. Iceland Telecom's fibre-optic cables total approximately 4,500km in length. Terminal equipment for fibre-optic connections is under constant development, and transmission capacity is ever-growing through various new technologies. At first, a system with a capacity of 155 Mb/s was installed on the fibre-optic network, which has now been expanded twice to a capacity of 2.5 Gb/s.

A new transmission route has been added for the northern route from Reykjavík to Seyðisfjörður in east Iceland for transmission of the FARICE submarine cable's connections to Reykjavík. Dense Wave Division Multiplexing (DWDM) equipment with a base capacity of 40 x 2.5 Gb/s is used. Technically, the system can be expanded to carry 160 wavelengths. The system calls at 12 places on the way, thereby opening possibilities of very high-bandwidth for various data connections, such as IP, ATM and Ethernet, to all main communities on the route. In addition, preparations are underway to install a new connection between Reykjavík and the northern capital Akureyri through the Sprengisandur desert, which will further increase the network's security.

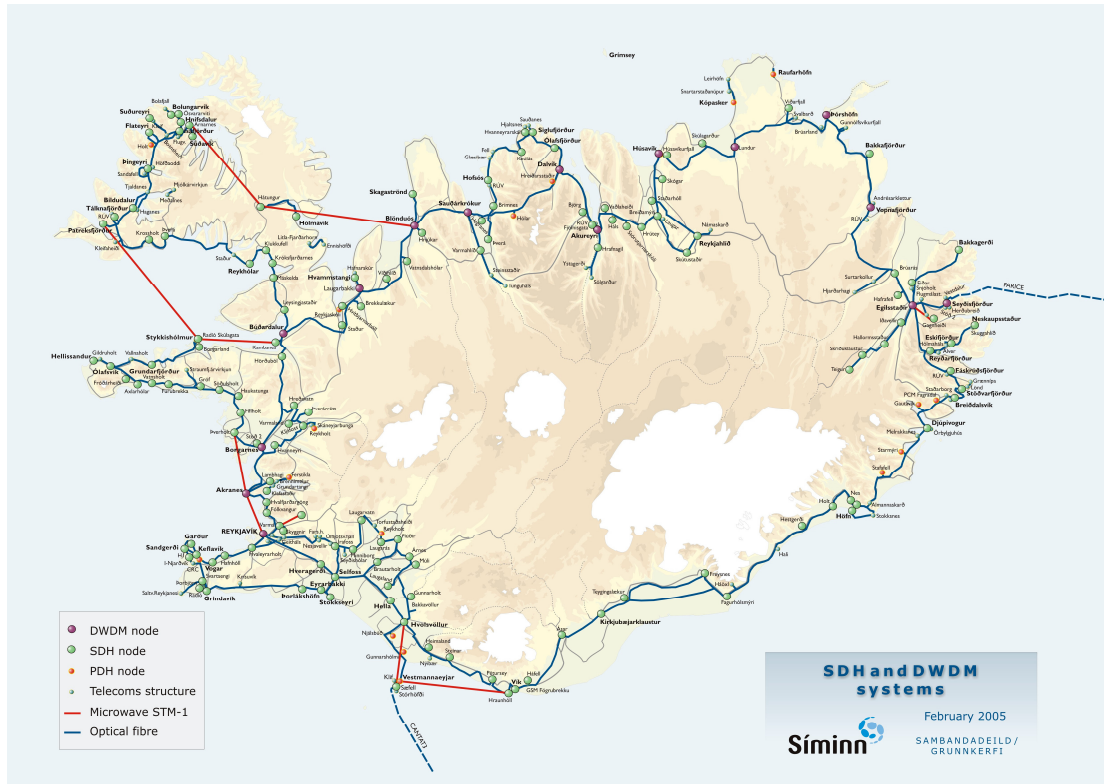


Figure 2-3 Iceland Telecom’s cable network.

In 1989, when the installation of fibre-optic cables around Iceland was well underway, an agreement was concluded between the Icelandic and US governments on behalf of the North Atlantic Treaty Organisation (NATO) on the installation, funding, operation and maintenance of and access to three of the eight pairs of the cable together with necessary accessories. These three pairs of the fibre-optic cable are used by NATO exclusively. They are, and will remain, fully owned by the Icelandic State but in the custody of Iceland Telecom on the State’s behalf. NATO’s right to use the three pairs will remain as long as the cable is in use or during the effective term of the bilateral Defence Agreement between Iceland and the United States.

Iceland Telecom handles the operation and maintenance of the fibre-optic cables, and a separate agreement is in force on the operation and maintenance of the section used by NATO. NATO was granted the right to use the three pairs in exchange for participating in the cost of developing the entire fibre-optic network. The section to which NATO contributed funds is just over 1,800km in length, while Iceland Telecom’s entire fibre-optic network totals approximately 4,500km. The figure below shows the part of the network to which NATO has right of use. NATO’s right of use does not restrict Iceland Telecom’s possibilities in utilising the five pairs owned by the company.



Figure 2-4 NATO's fibre-optic network

Iceland Telecom's access network consists of both conventional installations of copper cables and a broadband network together with street boxes. In new town areas, the installation of copper cables and the broadband network is performed in parallel with road construction and installation for other utilities (water, electricity, etc.) in co-operation with local authorities. Each year there are also extensive joint projects with local authorities renewing installations, pavements and streets in older areas. The copper-cable network is based on laying trunk lines from telephone exchanges to street boxes, from which local loops are installed to each building.

A common size for trunk lines is 100 to 1000 lines, and a number of such trunks are laid from each exchange to the town areas. Each street box can then serve tens to hundreds of users. The number of lines in local loops installed from street boxes during the past 10 to 15 years ranges from five lines for single-family houses and row houses to hundreds, depending on the building's size and function. In the past ten years, approximately 4,700km of copper cables have been laid in the subscribers' network, totalling over 143,000km in installed lines. Other telecommunications companies' access to subscribers' lines is currently provided only through the main distribution frame at a telephone exchange.

In 1995, Iceland Telecom started renewing the access network by installing the broadband network. A Fibre-To-The-Curb architecture is used, with a fibre-optic cable extending to street boxes. A fibre-optic cable is laid to each street box as well as into all multi-occupied buildings and business premises. At least four fibre-optic threads are laid to each street box. From the street box, a coaxial cable and a twisted pair of copper wire are laid into the building. If it is a multi-occupied building, the fibre-optic cable extends all the way into the

building. There are currently about 40,000 homes thus directly connected via fibre-optic cable or fibre-optic and coaxial cable. The street boxes are located in a manner ensuring that the length of the installation from the box into the building never exceeds 200m. In the past three years, tubes for air-blown fibre-optic cables have been installed from street boxes to each building. Since the spread of broadband started, Iceland Telecom has installed 900km of fibre-optic cables in the subscriber network, with fibre-optic threads totalling about 14,000km. In addition, 2,000km of coaxial cables and 200km of air-blow tubes have been laid.

2.2.1.2 International connections

From 1994 to year-end 2003, Iceland's telecommunications connections with other countries were mainly through the CANTAT-3 submarine cable, of which Iceland Telecom is one of the founding owners. The CANTAT-3 is a transatlantic telephone cable connecting North America and Western Europe. West of the Atlantic, it terminates in Canada, from where its connection extends to the US via the CANUS-1 cable, in which Iceland Telecom also has connections. At the European end, the CANTAT-3 branches to Iceland, the Faroe Islands, the UK, Denmark and Germany.

Iceland Telecom has operated satellite connections since 1980, for the past few years mostly as international back-up connections. These were partly continual connections and partly back-up connections for the CANTAT-3, for use during the submarine cable's downtime. Iceland Telecom's earth stations at Skyggvir in the town Mosfellsbær near Reykjavík and at Höfn í Hornafirði in south-east Iceland have been used for this purpose. Iceland Telecom holds a share in the international satellite operator Eutelsat, but sold its 0.13% holding in a comparable company, Intelsat, in 2004.

At year-start 2004, a new submarine cable, FARICE-1, was brought into service, linking Iceland and Scotland via the Faroe Islands. Pioneered by Iceland Telecom, the cable is a city-to-city network with termination points in Reykjavík, Tórshavn in the Faroe Islands and Edinburgh. Its full capacity is 100-fold that of CANTAT-3. Its owner is an independent limited liability company, Farice hf., a consortium including Iceland Telecom, FøroyaTele and other Icelandic and Faroese telecommunications companies, in addition to the Icelandic State.

Farice hf. has entered into an agreement with Iceland Telecom on the lease of the cable's connection from Seyðisfjörður, where it connects to land, to Reykjavík. Iceland Telecom manages the overall operation of the FARICE-1 network under a 10-year agreement with Farice hf.

Icelandic parties hold an 80% share in Farice hf., and a separate holding company, Eignarhaldsfélagið Farice ehf. (E-Farice), has been established for this asset. Iceland Telecom has a 37.1% holding in E-Farice ehf. At the end of the year 2003, E-Farice also acquired a part of Iceland Telecom's assets in CANTAT-3 and CANUS-1. This asset corresponds to a 200-Mb/s transmission capacity across the Atlantic, in addition to a 155-Mb/s connection from the landfall of CANUS-1 into New York. Iceland Telecom previously had a 5.8% share in CANTAT-3, sold 4.2% to E-Farice and thus retains 1.6%. The company also retains 2 x 45 Mb/s transmission capacity in CANUS-1. Iceland Telecom then leases the entire transmission capacity from E-Farice.

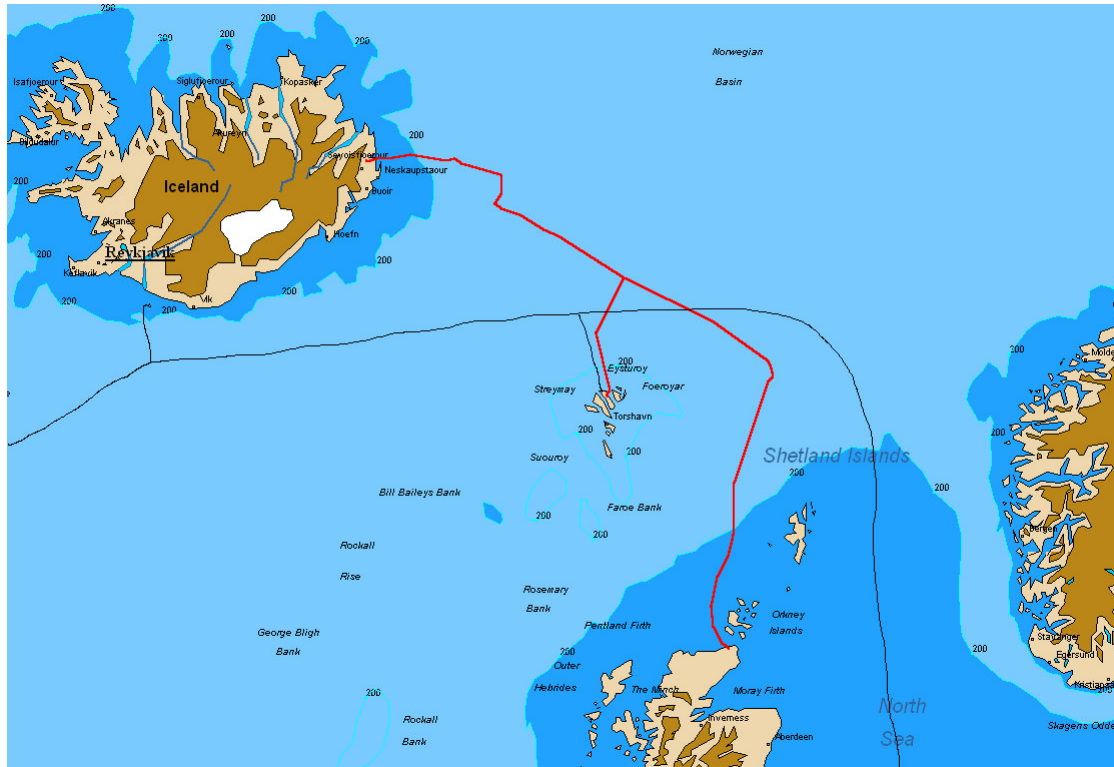


Figure 2-5 The FARICE-1 submarine transmission cable

When FARICE-1 was brought into service, the back-up connections via satellite were discontinued, as their cost was substantial. Preparations have also been made to transfer the continual satellite connections to submarine cable. Thus, the use of satellite links will be trimmed down significantly, and they will no longer form a part of Iceland Telecom's main network of connections. However, satellite connections will continue to play a role in certain services, such as the reception of TV broadcasts.

Iceland Telecom's main international connections are currently organised as follows: For voice telephony and Internet connections, the arrangement used has been to set up continuous connections via both submarine cables, CANTAT-3 and FARICE-1. The transmission capacity of each connection is sufficient to carry all traffic if one of them breaks down. The traffic is routed via the connection functioning properly. No additional back-up connections are envisaged for these connections.

2.2.1.3 Fixed-line network

The fixed-line telephone network consists largely of subscribers' lines, telephone exchanges and trunk lines. Customers connect to the telephone exchanges through subscribers' lines, and the trunk lines interconnect the exchanges. Automatic exchanges total approximately 230. This includes two international exchanges handling telephone traffic between Iceland and other countries and two switching centres routing traffic between international, regional and mobile exchanges as well as the exchanges of competitors. In addition, some of the company's largest clients are directly connected to switching centres. Regional exchanges number nine, five in the Greater Reykjavík Area and four outside it. They are connected to approximately 220 remote concentrators. During the past three years, about 80 new concentrators have been brought into service for ISDN services in rural areas. In order to

ensure communications security, all international and regional exchanges are connected to the switching centres via two separate links. In addition, the larger concentrators are connected in the same manner to regional exchanges.

ISDN services have been offered to customers since 1996. Iceland Telecom's ISDN systems are based on each connection having two phone lines in addition to a data line, a so-called *basic connection*. The phone lines can be used for both voice and data transmission at up to 128 Kb/s. It is also possible to connect to the ISDN network through a *main connection*, in which case there can be up to 30 phone lines or simultaneous calls on a single connection. The network's answer ratio increases with ISDN, which adds to Iceland Telecom's revenue possibilities, as phone lines are less likely to be busy due to data transmission or calls. Several pieces of equipment and phone numbers can be added to the same line, in addition to other possibilities not available in the general telephone network. Currently, 99.96% of Icelanders can purchase ISDN service.

In February, a Centrex (Central Office Exchange Service) system was brought into service. Centrex is functionally similar to a customer-premise private branch exchange (PBX), but provided by means of equipment located at Iceland Telecom. Iceland Telecom's system is structured in a manner eliminating the importance of companies' geographical location for their telecommunications, and enables businesses whose activities are widely spread around Iceland to combine all units into one centralised PBX-like system. With Centrex, mobile phones have also become part of corporate PBXs, with interoperability between mobiles and desk phones.

In 2004, five new automatic telephone exchanges were brought into use, and two exchanges were installed for rural ISDN development. This concludes the development of automatic exchanges under a rural ISDN development plan. Some of the oldest automatic exchanges were also renewed. Other recent additions include text messaging (SMS) via fixed-line phones and new technology for transmitting voice calls over the Internet (VoIP).

2.2.1.4 Mobile telephony network

Iceland Telecom's mobile telephony services now cover the vast majority of the Icelandic population. As shown in the figure below, the coverage area of its mobile services extends to all of Iceland's urban areas as well as to many major tourist destinations and the most frequently travelled sections of the Ring Road circling Iceland. The network's base stations number over 260 and cover an area where 98% of all Icelanders reside. Individual users connect to the base stations via radio connection, and the stations are connected largely through Iceland Telecom's fibre-optic network, which routes the traffic directly to a central office, from where it can travel further within the network or into other telecommunications networks. The network's central equipment is divided between two locations, the Varmá and Breiðholt telephone exchanges, and all basic equipment is doubled to increase operating security, in accordance with telephony-service conventions.

Iceland Telecom's GSM network, which was launched in 1994, consists of relatively homogenous systems from well-known producers, all of which are leaders in their respective fields. The GSM system is structured in a manner enabling the provision of all conventional services in addition to MMS services, a so-called VIT service based on the use of SMS/OTA and WAP-based services. In December 2004, Iceland Telecom's SMS system was renewed,

and the new system was opened. Recently, Iceland Telecom has been building up an extensive GPRS network in parallel with and as part of the company's radio distribution network. During 2003-2004, Iceland Telecom renewed all equipment for pre-paid services.

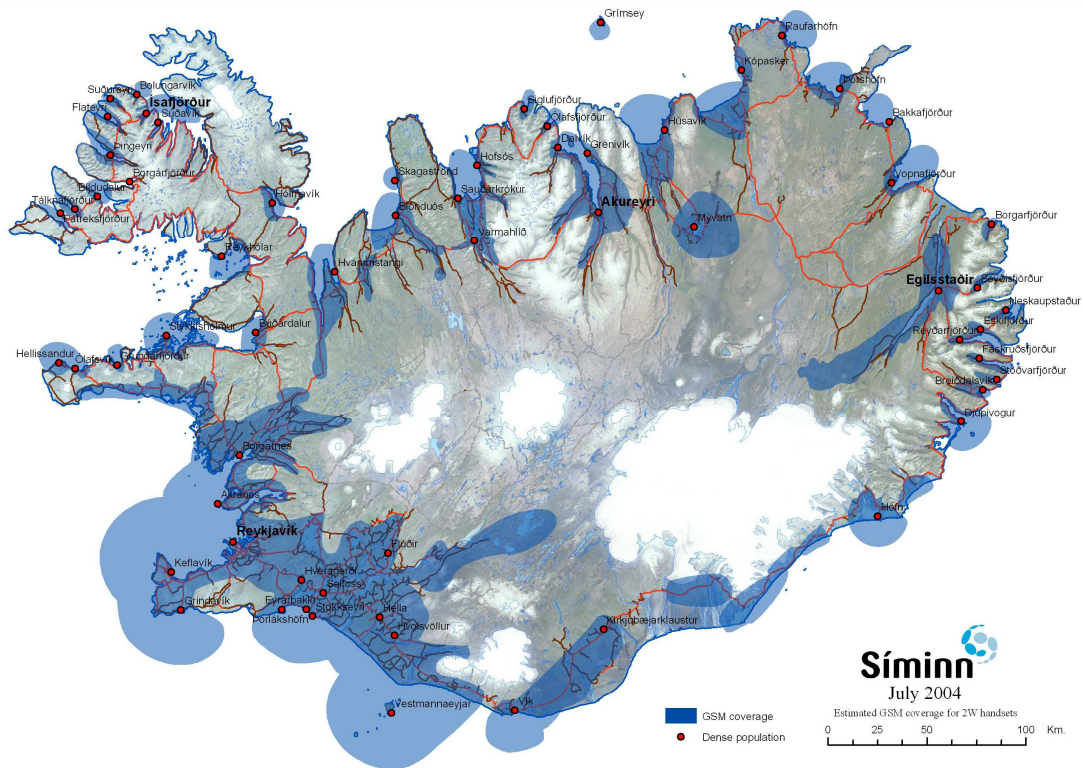


Figure 2-6 Coverage area of GSM mobile services

Iceland Telecom's NMT (Nordic Mobile Telephone) network was launched in 1986. The network's operation has been successful and stable, although the number of its users has dropped somewhat and its use has contracted. Investment in the network has nearly stopped, and Iceland Telecom has cancelled its NMT operating licence with a two-year notice, although the Post and Telecom Administration can extend it for two years or until 1 January 2009. In addition, discussions have started with the Post and Telecom Administration on a service that could replace the NMT network.

The long-range NMT network includes numerous base stations, and its coverage area includes most the country as well as off-shore waters. The following figure shows the location of base stations and the coverage area:

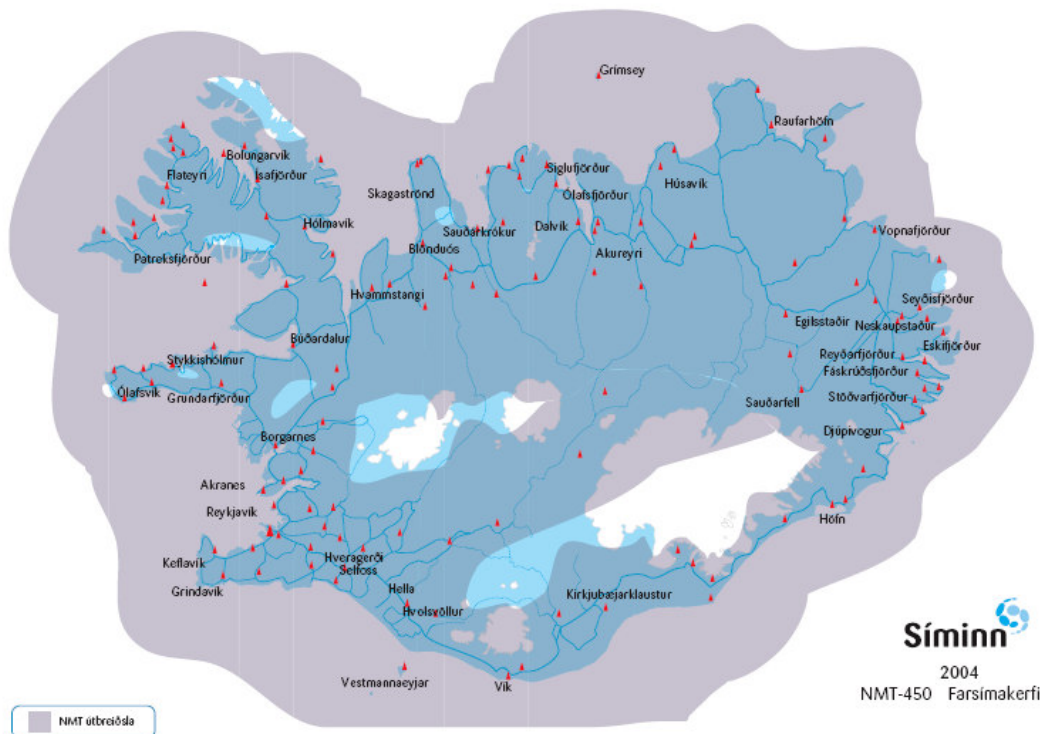


Figure 2-7 Coverage area of NMT services

2.2.1.5 Data transmission

Data communications have seen a shift away from circuit-switched transmission towards packet-switched networks using bandwidth more efficiently, thereby increasing networks’ cost-effectiveness and data-carrying capacity. Iceland Telecom has responded to this trend by building wide-area networks (WANs) based on ATM and MPLS networks.

Iceland Telecom’s WANs circle the country and are interconnected through the company’s fibre-optic network. The WANs have proved very stable. Centralised networking also simplifies the installation of back-up connections, as there is no need to set up new channels from all connection points for the back-up. Instead, a back-up channel is installed from the location for which access is to be ensured into the central private network of the business in question.

Iceland Telecom’s WANs carry all known communications media, i.e. voice, data and images. Through prioritising data, companies can choose what communications or business systems should not suffer delays, and have less time-dependent data give way to real-time data. This opens up possibilities of, for example, sharing voice and data transmission via the same connection where the quality of voice connections can be ensured. Data prioritisation thus enables better bandwidth utilisation than previously known. The WANs use, on the one hand, Multi-Protocol Label Switching (MPLS), which has spread substantially in the development of telephone companies’ IP networks worldwide, and Asynchronous Transfer Mode (ATM) technology on the other hand.

Iceland Telecom offers WAN services in all urban areas with a population of at least 150. Some of these places do not have connection points to the ATM network, but Iceland Telecom has an obligation to pay for trunk lines from these places to the nearest ATM point for all 2 Mb/s connections.

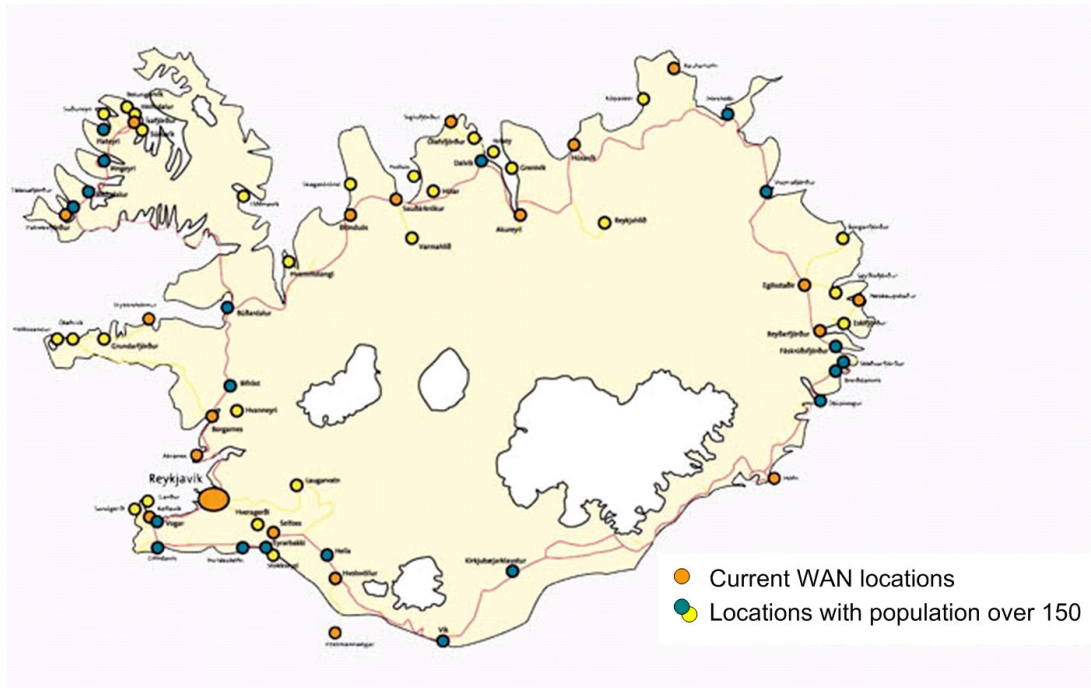


Figure 2-8 Iceland Telecom's wide-area networks (WANs)

ADSL networks have been installed in the Greater Reykjavík Area as well as 50 other rural communities, covering 92% of the Icelandic population. The ATM network is the transmission backbone for Iceland Telecom's ADSL services, and preparations are underway to establish IP connectivity for ADSL services' transmission network.

Various changes were introduced for ADSL services on their 5-year anniversary in 2004. This included up to a four-fold increase in transmission capacity. The possibility of sending TV signals over ADSL (TVoDSL) was added in ten rural communities. Plans are afoot to continue to build the ADSL network to make TVoDSL available in up to 60 rural communities and the capital-city area already in 2005, which is the largest-scale project undertaken by Iceland Telecom in many years.

The broadband network is accessible to 40,000 homes in the Greater Reykjavík Area. In addition, 5,000 homes outside the capital area can connect to broadband. Increased focus on TV broadcasting via this network is expected in the coming months. The existing broadband network carries over 50 TV channels digitally. This broadcasting began in November 2002. In addition, over 20 radio channels are broadcast digitally. In parallel with this are analogue transmissions of over 20 TV channels and 20 radio channels, but analogue distribution will discontinue within few years. The broadband network can carry hundreds of TV channels digitally, depending on the end-user equipment connected to the network. Digital broadband

enables interactive TV, pay-per-view, video-on-demand, high-speed Internet access, voice and video telephony, etc.

2.2.2 Companies

In 2000-2001, Iceland Telecom took active part in the development of IT and telecommunications companies, both through co-operation and direct ownership. The objectives of this participation included strengthening Iceland Telecom in a changed technological and competitive environment. At year-end 2001, Iceland Telecom held shares in over 30 companies. During the autumn of 2002, the company entered into an agreement with the Icelandic Software Fund (which later merged with Straumur Investment Bank hf.) on the purchase of Iceland Telecom's assets portfolio in IT enterprises, which was in line with the company's policy of reducing investment in venture companies not directly related to Iceland Telecom's core activities. The agreement included that Iceland Telecom receive listed shares in the Icelandic Software Fund in exchange for unlisted shares as well as access to companies in the Fund's assets portfolio.

Iceland Telecom's main holdings in companies at year-end 2004:

<p>ANZA hf. – 81.1% share</p> <p>ANZA was established in 2001 through the merger of Álit ehf., Nett ehf., Veforg ehf. and Miðheimar ehf. ANZA specialises in the operation and development of IT systems and offers wide-ranging and flexible services. ANZA is brand-independent, which is important for business credibility in consulting and business solutions.</p>	<p>Iceland Television ehf. - 100% share</p> <p>Iceland Television is a large shareholder in the Iceland Television Company, which runs the TV channel <i>SkjárEinn</i>. Iceland Television will during the coming months be developed as a content provider distributing its content through Iceland Telecom's telecommunications network.</p>
<p>E-Farice ehf. – 37,1% share</p> <p>E-Farice was founded for the share of Icelandic investors in Farice hf., which performs installations and the operation of the new FARICE-1 submarine transmission cable between Iceland and Europe.</p>	<p>Carrera Global Investment Ltd. - ~10,6%</p> <p>Carrera is a consortium of Björgólfur Thor Björgólfsson, Iceland Telecom, Straumur Investment Bank, Burdará and other Icelandic investors for a holding in the Bulgarian Telecommunication Company, BTC. Iceland Telecom's share in Carrera corresponds to a 1.67% share in BTC.</p>
<p>Stefja hf. (TrackWell) – 54,8% share</p> <p>A 54.76% holding. Stefja offers software for wireless telecommunications systems, e.g. for remote surveillance, positioning systems and maritime reporting. Stefja has also carved out a niche for itself as a leader in software development for mobile telephony systems</p>	<p>Tæknivörur - 100% share</p> <p>The company imports and sells telephone equipment, including mobile phones, home phones and various accessories.</p>
<p>Farsímagreiðslur - 40,5% share</p> <p>This company offers payment services using mobile telephones.</p>	<p>TM Software - ~1,1% share</p> <p>TM Software focuses on its own software development and related marketing and services. Its software is sold under the brands of subsidiaries operating in separate specialist areas.</p>

At year-end 2003, the sale of Iceland Telecom's share in the satellite company Inmarsat was finalised, and the start of 2004 saw the sale of its share in New Skies Satellites. In late 2004, Iceland Telecom and other shareholders in Intelsat agreed to sell all shares in Intelsat to a company owned by Zeus Holdings Limited, and an agreement on this sale has now been finalised. Iceland Telecom still has a holding in Eutelsat. All of these companies operate satellites.

At the end of 2004, Iceland Telecom bought all shares in Iceland Television, which holds a substantial share in the Iceland Television Company, the operator of the TV channel *SkjárEinn*. Iceland Television also bought the broadcasting rights to the English Premier League, which ranks among the world's most popular TV material. This purchase marked an important step for Iceland Telecom towards increased participation in the TV and entertainment market, and was in keeping with the corporate marketing-and-image strategy of *enriching life*. Through partnership with Iceland Television, the company intends to be a leader in the development of content provision, taking advantage of the great potential offered by new developments in digital data transmission. Iceland Television will have charge of ensuring Iceland Telecom's access to interesting content to be distributed via, e.g., its current broadband and ADSL networks.

2.2.3 Other assets

Iceland Telecom currently owns approximately 320 real-estate properties, totalling about 39,000m². This includes 21,000m² in the Greater Reykjavík Area, about 13,000m² in other urban areas and about 5,000m² in rural areas. Of these, approximately 43% are technical facilities or state-of-the-art systems centres, 30% are office facilities and 27% are miscellaneous. The company is now headquartered in relatively new and fine future facilities on the streets Suðurlandsbraut and Ármúli in Reykjavík as well as a number of adjoining buildings. Recent efforts have been made to reshape the appearance of Iceland Telecom's retail outlets in line with its new image strategy. Already, six of its 12 outlets have been modified, and image-revamping efforts continue.

In the past five years, Iceland Telecom has invested in powerful IT systems intended to deliver streamlining, more effective operations and further improved services. The company has a large number of IT systems, including conventional financial data and customer systems, as well as systems relating more directly to telecommunications services. The most important information systems are the invoicing solutions ICMS and Infranet and the financial suite SAP/R3.

Iceland Telecom operates a large fleet of vehicles, totalling 160 cars and other vehicles and earth-moving equipment. The company also owns various other necessary specialised equipment for operating its systems, measuring devices and other equipment.

2.3 Services

Iceland Telecom provides a full range of telecommunications services. Its future vision is summed up in the corporate motto: *Iceland Telecom leads you into the future*. Through expert knowledge, initiative and understanding customer needs, clients are provided with tailor-made services. Iceland Telecom's future vision also comprises the goal of enhancing services through further product diversification and synergistic use of all types of media and technologies, such as mobile phones, TV and computers, assisted by Internet technology.

2.3.1 Fixed-Line Services

Customers with conventional connections (POTS) to the public telephone network numbered approximately 115,000 at year-end 2004, ISDN users were nearly 14,000 and corporate ISDN trunk connections numbered just over 300.

The number of users in the general public-telephone network peaked in 2000, and user numbers have dropped since. There are a number of reasons for this. First, the number of users has decreased owing to stiffening competition in the residential and corporate markets. Second, connections have subsided due to the diffusion of ADSL in the corporate market, while in the past small and medium-sized enterprises connected to the Internet via special IDSL connections or even modems.

The use of the public telephone network has also decreased recently, mainly due to a drop in subscriber numbers, increasing competition and the drift towards always-on Internet connections, such as ADSL, broadband or microwave. Furthermore, the surge in mobile phone use has changed communications within the fixed-line network, and calls via the Internet have increased.

In 2004, fixed-line telephone services were increased further, new automatic telephone exchanges were brought into service and the year saw targeted revamping aiming to further ensure service quality. Installations of ISDN exchanges were also completed on target, further raising the fixed-line service level.

In February 2001, Iceland Telecom introduced a new service, Centrex, which provides companies whose activities are widely spread around Iceland with one centralised PBX-like system. Centrex solutions can be applied in a number of different ways tailored to business needs. Iceland Telecom has already introduced Centrex for all its operations, excluding its service centres. There are currently 260 companies connected to Centrex, with nearly 6,000 mobile and fixed-line numbers.

Iceland Telecom will soon offer hosting of Voice over Internet Protocol (VoIP) services in the corporate market, which are called IP Centrex. This is an IP-based virtual PBX service particularly suited to businesses with activities spread over a large geographical area. Companies will also have the option of interconnecting their exchanges via IP and to Iceland Telecom's telephone network. These total IP technology solutions will enable companies to use their IP connections for both voice and data transmission, as well as substantially simplifying and streamlining the business telecommunications environment.

Important developments have taken place in VoIP, in which Iceland Telecom takes active part. Many companies now offer international voice transmission services via the Internet. Iceland Telecom is currently developing new technologies and connecting solutions to its existing systems. The company has recently carried out tests on VoIP services scheduled for marketing in 2005, and sees VoIP as an opportunity to develop voice-telephony solutions still further. Through Iceland Telecom's solutions, customers will be able to, among other things, speak through their computers via a special computer phone and use videophones as well as various other integrated services.

2.3.2 Mobile Services

Iceland Telecom operates two mobile telephony networks across the entire country. Its mobile coverage area includes 98% of the Icelandic population and extends to all urban areas with more than 200 inhabitants as well as many summerhouses, tourist destinations and frequently travelled sections of the Ring Road.

At year-end 2004, Iceland Telecom had concluded roaming agreements with 280 telecommunications companies in 115 countries, enabling its customers to use these companies' services. Mobile customers at year-end 2004 used approximately 173,000 numbers, which corresponds to a nearly 63% market share in Iceland. Prices for mobile services have continually fallen over the past few years.

Mobile number portability became available in 2004, allowing customers to transfer from one telecommunications service provider to another without changing their number. Significant changes were made to telecommunications and information systems in order to enable number portability.

In addition to voice and data transmission services via the mobile network, Iceland Telecom increasingly offers various value-adding services. In all cases, services are based on standard technology, such as MMS, SMS, VIT and WAP. Multimedia Messaging Service (MMS) is a messaging service, similar to text messaging, that can deliver images, graphics, voice and audio clips between mobile phones that have the required features. Iceland Telecom's customers can also dispatch their personal MMS images to Iceland Telecom's website through a service named mBlog. The use of MMS services has also increased considerably, or four-fold during 2004. Image messaging between the Icelandic mobile networks was opened in the year.

Text messaging (SMS) is now ingrained in our culture as a convenient, cheap and simple way of sending short written messages or obtaining services from information providers and other service providers. Text messaging is steadily growing, and last year the number of text messages sent by Iceland Telecom customers through the company's network was in the tens of millions. The VIT service, which is based on SMS messaging technology coupled with the programming of menus in the user's SIM card, enables the user to access various information, such as news, flight schedules, telephone directory numbers, cultural events, etc. The VIT service also enables secure banking transactions via the GSM Mobil Bank as well as purchasing of products and services, debited directly to the user's debit or credit card. WAP services allow users to connect to areas on the Internet to obtain information or buy products or services on offer there.

Iceland Telecom has been strengthening and improving data transmission in the GSM network, not least after the advent of MMS, which uses General Packet Radio Service (GPRS) technology to transmit MMS messages. All of these developments are part of the steps being taken by Iceland Telecom to participate fully in the next generation of mobile phone technology, while at the same time always focusing on the needs and ever-increasing demands of customers.

The use of GPRS services has jumped over the course of the past year, and the service's expansion to other countries has been successful. At year-end, Iceland Telecom's customers could use GPRS services in 45 GSM networks in various parts of the world.

The popularity of Frelsi Pre-Paid credits has grown much in the past few years. The service range for pre-paid credits has become very similar to that of regular subscription. For example, all new services, such as MMS, GPRS, WAP, etc., are also offered to Frelsi users. Through new Frelsi technology, an equally broad range of fee collections can be offered as in

post-paid subscription, including discount packages based on the scope and type of use. Iceland Telecom has for a long time placed much emphasis on electronic Frelsi credit top-ups by ATMs and Internet banks. Iceland Telecom is also launching a new way of adding credits by mobile-phone payment, which has been developed in collaboration with banks and payment-card companies.

Iceland Telecom's NMT services, which have a much longer range than GSM services, cover nearly the entire country. NMT subscribers use about 21,700 numbers. NMT operations were stable during the year, with subscriber numbers falling slightly. No new development of the NMT network was undertaken during the year. Iceland Telecom also offers satellite services via the Inmarsat and Iridium systems for those customers requiring even longer-range mobile phone services.

In 2004, Iceland Telecom launched a new service, Maritime Mail, which was received well. This service offers seagoing personnel access to e-mail and other data via GSM, MNT and satellite telephone.

2.3.3 Data Services

Iceland Telecom's wide-area network (WAN), which can carry all types of telecommunications, including voice, data and images, enables the company to offer its customers powerful data-transmission services, or WAN Services. WAN Services are well-suited to companies with operations at several locations, enabling interconnection of offices all around Iceland with corporate headquarters as well as the use of the latest data-transmission solutions. The bandwidth offered ranges between 64 Kb/s and 100 Mb/s. Customers can also opt between symmetrical and asymmetrical data rates, i.e. whether the speed of transmission should be the same to and from the user.

Iceland Telecom's WAN Services are offered as follows:

Iceland Telecom's IP network offers flexibility and substantial data-carrying capacity. It uses Multi-Protocol Label Switching (MPLS), which most telecoms operators predict will be the basis of the future's IP networks. The transmission capacity offered ranges between 256 kbit/s and 100 Mbit/s.

Iceland Telecom also offers Frame Relay services, which are particularly suited to businesses with operations dispersed over a wide geographical area. The data-carrying capacity ranges from 64 kbit/s to 2 Mbit/s, so the service is not suitable for all companies.

Iceland Telecom's ATM service is offered to companies in a closed multi-service network, and provides a capacity of 2 Mbit/s to 100 Mbit/s. The ATM network can carry all types of content, including voice, images and data.

Iceland Telecom also offers leased lines, which always ensure maximum bandwidth. Leased lines are most suitable for short distances, and the transmission rate ranges between 64 kbit/s and 2 Mbit/s.

Data transmission services for residential and smaller corporate clients use Iceland Telecom's ADSL network, which enables teleworking. Users can either connect to their company's

local-area network (LAN) directly via the ADSL network, or by using a Virtual Private Network (VPN) router through the Internet. Residential ADSL connections are mainly used for high-speed, always-on Internet connections. There are three data-transmission rates, 1, 2 and 3 Mb/s, to users but lower rates from them.

The adoption of ADSL continues to grow, and ADSL service was set up for six additional communities in 2004. Iceland Telecom's ADSL services are now offered in the Greater Reykjavík Area and 50 other communities. Demand for the service is high, with subscriber numbers growing by more than 25% in 2004. The addition of TV broadcasting via ADSL is expected to boost demand further.

2.3.3.1 Internet services

Iceland Telecom's Internet services are twofold: first, tailor-made corporate solutions, including access to an international Internet gateway, and second, residential services. The company has approximately 42,000 residential Internet subscribers, who connect through either a conventional modem via ISDN lines or ADSL. In all cases, the same price is paid for access in all parts of the country. Iceland Telecom's Internet subscriptions service offers various price options, depending on what value-adding services the subscription includes. Internet services via broadband are also offered.

The company's Internet service has a 465 Mbit/s connection via the FARICE-1 and CANTAT-3 submarine transmission cables. The opening of FARICE-1 marked a massive increase in bandwidth access for Iceland Telecom's customers. The company's Internet division has a 1 Gb/s connection to the Reykjavík Internet Exchange, which is the exchange for Icelandic Internet service providers, preventing domestic traffic from flowing through international connections.

Internet subscriber numbers grew in 2004, the highest rise being in ADSL subscriptions, or by about 50%. The number of dial-up subscribers, on the other hand, dropped, which is the other side of the same coin and a normal trend.

2.3.3.2 International connections

Changes were introduced in overseas connections upon the advent of the FARICE-1 submarine transmission cable. Iceland Telecom leases FARICE connections from Seyðisfjörður in east Iceland to Reykjavík. The transmission capacity of this connection's northern route was stepped up substantially to meet FARICE-related demand. The capacity of the south connection will also be increased considerably, not least to ensure the security of international connections.

Iceland Telecom offers leased lines for overseas connections, normally through special offers. If requested and the capacity is available, a back-up connection is provided through a cable not normally carrying the main leased-line connection. In the event that the main route breaks down, the connections are transferred to the back-up. Instead of a back-up, which is only activated when a connection breaks down, customers also have an option of having two separate always-on connections installed.

2.3.4 Connections

The Network division offers products in wholesale both to intra-company divisions of Iceland Telecom and to external parties. Network's external revenues have been growing recently due to competitors' increased market share, which applies particularly to revenues from the leasing of local loops.

Network's revenues derive mostly from the leasing of local loops and leased lines, which are rented for exclusive connections of varying bandwidth between certain locations. Dark-fibre leasing, both to external customers and Iceland Telecom's TV and Radio Broadband Service, is on the increase.

2.3.4.1 Leased lines

Leased lines are offered to telecommunications companies at wholesale, but in other respects the service is the same as to companies, except that a higher transmission rate is offered for trunk lines, ranging from 64 Kbit/s up to 662 Mbit/s.

2.3.4.2 Local-loop leasing

The Network division offers local-loop leasing to telecommunications operators. Local lines are leased for either full or shared access. Full access means that the operator leases the entire line and can use it for voice-telephony services and/or data-transmission services. Shared access is when one company uses the copper line for voice-telephone services and the other operator uses it for data-transmission services, such as ADSL.

2.3.4.3 Fibre-optic lines

Dark fibre is a fibre-optic cable leased without optical transmission equipment. The customer then sets up the own user-premise equipment.

2.3.4.4 TV and radio transmissions

Iceland Telecom handles TV and radio transmissions locally and between communities. Transmission is carried over broadcasting lines in the telecommunications network and is one-way unless specified otherwise.

2.3.5 Front-line services

Iceland Telecom strives to make life and work easier for its customers. Its aim is to always put the customer first. To sharpen this focus, Iceland Telecom's sales and marketing is divided into the residential and corporate market, as well as marketing and services. Sales and marketing activities are integrated in a manner ensuring targeted sales and a consistent market message.

Front-line services are divided into three parts: Business Market, Consumer Market and Customer Services. This sharpens the role of individual units in sales and services so that the customer experiences an efficient and clear sales and marketing process in all its relations with Iceland Telecom.

2.3.5.1 Business Market

Business Market sales activities are threefold: Key Accounts & Accounts, Sales Advice and Regional Service Centres. Key Accounts & Accounts and Sales Advice come directly under Business Market, while Regional Service Centres are controlled by Consumer Market,

although also serving corporate clients. Iceland Telecom is highly committed to its Business Market clients, as well as placing great emphasis on adapting its service range to corporate customer needs.

2.3.5.2 Consumer Market

Consumer Market sales take place mostly at the company's outlets and Service Centre as well as through its website, www.siminn.is, and 30 resellers around the country.

2.3.5.3 Outlets

Iceland Telecom runs 12 service outlets located throughout the country, in addition to a branch in the US naval-base area at Keflavík Airport. The outlets offer customers comprehensive solutions, i.e. telephone equipment, accessories and a wide range of data-transmission solutions fulfilling various customer needs, including entertainment.

2.3.5.4 Information and directory services

Iceland Telecom's information service answers directory enquiries about domestic and overseas phone numbers, and provides telegraph services and various assistant phone services, including a call-up service, teleconferencing assistance, etc. Directory-enquiries staff number over 100 at four locations around the country. This service is most extensive in Reykjavík and Akureyri. The number of directory enquiries fell slightly last year. In accordance with its universal-service obligation, Iceland Telecom publishes a printed telephone directory annually for all of Iceland, which is also accessible on the Web (www.simaskra.is).

2.3.5.5 Service growth areas

Iceland Telecom also operates a strong Service Centre, which handles customer support and field services, as well as a Corporate Service Centre. The Service Centre received 900,000 phone queries in 2004, a jump from the preceding year. The greatest increase was in services to ADSL and Internet users, which is reflected in much longer and more complex calls.

Iceland Telecom handles all services to subscribers to the multi-online game EVE Exodus, and a new contract for servicing the game was signed at year-end. The number of subscribers nearly doubled during the year, and stood at 50,000 at the turn of 2005. Customer satisfaction with this service has remained constant at one of the highest levels in the world, or upwards of 80%.

2.3.6 Other services

2.3.6.1 Digital TV distribution

The distribution of digital TV content substantially improves the utilisation of Iceland Telecom's telecommunications networks. Better utilisation increases the cost-effectiveness of strengthening the company's distribution system still further. Iceland Telecom's digital TV distribution started through its fibre-optic network, the broadband, in 2002, and now reaches about 40,000 homes.

One of the reasons why Iceland Telecom launched digital TV distribution via ADSL was to boost the spread of the digital distribution network significantly over a short period through making use of the great investment that has been made in telecommunications systems. In this respect, the company is taking steps similar to those of other forward-looking telecommunica-

tions companies around the world. Increasingly closer ties are being forged between telecommunications and TV broadcasting operators worldwide, and nearly all telecommunications enterprises comparable to Iceland Telecom are taking part in this process. This includes Telenor, TDC, British Telecom, France Telecom, Telecom Italia and more companies.

2.3.6.2 Broadband TV

TV services including over 50 channels are offered through Iceland Telecom's fibre-optic network. About 40,000 homes have access to this system, with 5,000 added in 2004. Since year-end 2002, the TV channels' distribution has been digital. In addition, over 20 radio channels are broadcast digitally. In parallel with this are analogue transmissions of over 20 TV channels and 20 radio channels, but analogue distribution will discontinue within few years.

The broadband can carry hundreds of TV channels digitally, depending on the terminal equipment connected to the network. Plans have been on the drawing board for interactive digital TV over broadband, and such a service is likely to be offered in the coming months. Looking longer-term, all transmission to homes of voice, data and video will be via broadband. Services will develop at varying rates, but the broadband network should be able to meet the needs that arise.

2.3.6.3 TVoDSL

The year 2004 saw a watershed when Iceland Telecom commenced digital TV broadcasting via its ADSL network for the Icelandic channels *SkjárEinn*, the National Broadcasting Service (RUV), *SkjáSport* and seven foreign channels. This service was introduced in ten communities outside the Greater Reykjavík Area, none of which previously received *SkjárEinn*'s broadcasts. The plan is to provide this service in nearly 60 communities outside, as well as in, the capital-city area already in 2005, which represents one of the most extensive projects undertaken by Iceland Telecom in years.

Iceland Telecom intends to increase the number of channels to be shown through the ADSL network in certain areas in order to make its supply comparable to that currently carried over broadband. In addition, plans are moving ahead to offer various interactive solutions related to the TV service, including video-on-demand, subscription video-on-demand and network Personal Video Recorder (nPVR).

The rationale behind Iceland Telecom's foray into the TV market and content-distribution strategy is that conventional telecommunications services, which have driven the development of telecommunications networks in the past, are facing challenges. For this reason, Iceland Telecom has stepped up its focus on new opportunities – a new range of telecommunications services to take over. Like many telecommunications companies throughout the world, Iceland Telecom has seen opportunities in using digital and interactive telecommunications technology to offer superior TV and entertainment services, for which substantial growth is projected in the coming years.

Interactive TV will enable the use of various services through TV, which are currently accessible only through Internet-connected computers or mobile phones. Examples of such services include e-mail and short text messaging. Supply can be expected to increase in the next few years, as various foreign parties have shown an interest in distributing content via

Iceland Telecom's network. The acquisition of Iceland Television supports Iceland Telecom's strategy to develop digital TV in Iceland to a par with world-leading countries in times to come.

2.3.6.4 Entertainment Web

The entertainment section of Iceland Telecom's website is enormously popular and frequently accessed. It contains various entertainment, news and information. The supply of entertainment is ever-expanding, and Iceland Telecom has taken part in this trend in a targeted manner. The website offers access to games for mobile phones and PCs, tones and icons for mobile phones and photo weblogs maintained on its *mBlog* web by users via their mobile phones.

The website can also be used to access various features for mobile phones. This includes humorous voice mail messages, information about films, RADAR locating services and a dating service. Those unable to receive multimedia messages to their phones can access them on Iceland Telecom's website.

The website can also be used for sending various messages, including short text messages free of charge and group messages.

According to standard web measurements, traffic on Iceland Telecom's website soared by over 42% between 2003 and 2004, and page views increased nine-fold. The rise in page views indicates that customers are using the website in a more diverse manner than previously – which in addition to being a source of information is also a shop and self-service portal.

Iceland Telecom operates the web-community platform *hugi.is*, which is part of a range of new services developed by the company and enjoys popularity among young Icelanders.

2.3.6.5 TETRA network

In mid-2004, Iceland Telecom took over the operation of the TETRA network, a secure digital-network emergency service for the police and fire brigades. Iceland Telecom has already introduced substantial changes to TETRA's operations in accordance with the wishes of the company's customers. For example, only one TETRA network is now operated instead of two, and its service area is more clearly defined than previously.

2.4 Telecommunications and competitive environment

2.4.1 The Icelandic market

Through the incorporation of the former Post and Telecommunications Authority and introduction of competition in the Icelandic telecommunications market, an emphasis has been placed on market forces shaping the pricing of service. Current telecommunications legislation stipulates that operators with significant market power must grant other operators access to their networks or network sections, and tariffs shall then be based on cost and reasonable profit margins. Naturally, Iceland Telecom has granted such access, and its tariffs have been based increasingly on cost analysis.

2.4.1.1 Telecommunications, IT and media distribution

The Icelandic telecommunications market has undergone substantial growth in the past few years, and a number of new companies have entered the market. In the mobile-telephone market, six enterprises have been granted operating licences by the Post and Telecom Administration (PTA). On 27 June 2000, the PTA issued new licences to Lína.Net hf. and IMC Iceland ehf. for the operation of mobile telephone networks in the GSM 1800 frequency range. Halló Frjáls-fjarskipti hf. and Íslandssími GSM hf. were granted licences on 5 June 2000 and prior to that Iceland Telecom and Tal hf. already had licences for GSM 1800 mobile telephone services. Iceland Telecom, Íslandssími and Tal had also been issued GSM 900 licences. The enterprises that were issued licences did not all start up, and two of them merged into Og fjarskipti. Now, only Iceland Telecom and Og fjarskipti offer mobile telephone services in Iceland. IMC still has a licence, but has not started to offer any services. Other companies have turned in their mobile telephone licences.

Tal (now merged with Og fjarskipti) has offered mobile telephone services since 1998 with good results. Following the merger of Tal and Íslandssími, the merged company, Og fjarskipti, commands an approximately 37% market share based on the number of users. Og fjarskipti and Iceland Telecom have concluded a roaming agreement in Iceland, which ensures extensive coverage for Og fjarskipti.

The table below shows the currently registered telecommunications enterprises in Iceland and the type of services that they offer.

Company:	Type of service
IMC Ísland ehf.	DCS 1800 mobile telephone services
Núll-Nú ehf.	Mobile telephone services
Skrín ehf.	Telecommunications networks and data-transmission services
Internet á Íslandi hf.	Telecommunications networks and voice/data-transmission services
Snerpa ehf.	Telecommunications networks and voice/data-transmission services
Teleglobe Norge AS	Telecommunications networks/access to transmission capacity
Tetra Ísland ehf.	Telecommunications services and networks/TETRA
Radiomiðun ehf. (Inmarsat)	Satellite telecommunications services
Martel ehf.	Satellite telecommunications/personal phone services
Íslenska útvarpsfélagið hf. The National Broadcasting Service (RUV)	Telecommunications services: radio and TV broadcasting
The Municipality of Stykkishólmur	Data-transmission network
Ábótinn ehf. Ásgeir Þorleifsson ehf. Firstmile á Íslandi ehf. Reykjavík Energy Toppnet ehf. Tölvun ehf. Videocom/Rafdreifing ehf. Þekking - Tristan hf.	Data-transmission networks and services

Equant á Íslandi ehf. Magnavík ehf. Magus ehf. SITA Skyggirnir hf. Skýrr hf. Tölvu- og rafeindapjónusta Suðurlands ehf.	Data-transmission services
Bloomberg L.P.	Data-transmission services and resale of leased lines
MetNet ehf.	Data-transmission services and telecommunications networks
Nepal hugbúnaður Tölvusmiðjan ehf.	Data-transmission services and wireless telecommunications network
Xantic	Data-transmission services via VSAT system
Fjarski ehf.	Leased-line services and general telecommunications network
Tengir ehf.	Fibre-optic network
Íslandsmiðill ehf.	Multimedia services and wireless telecommunications network
DVD-Margmiðlun ehf.	Operation of a broadband system for radio broadcasting
Radióvik ehf.	Operation of a cable system
Europe com Ltd.	Phone cards for international calls, etc.
Marstar International ehf.	Telephone services via satellites
Farice hf.	Submarine transmission cable
Neyðarlínan hf.	Voice-telephony services/emergency telephone answering
Flugfjarskipti ehf.	Voice services to aircraft
IP fjarskipti ehf.	Voice/data-transmission services and digital TV
Iceland Telecom hf.	Voice-telephony services, GSM, NMT, etc.
Og Fjarskipti hf. Anza hf. Atlassími ehf. Emax-þráðlaust breiðband ehf. Fjölnet ehf. Gagnanet ehf. Hringiðan ehf./Vortex Inc. Lína.Net ehf. Margmiðlun hf. Netsamskipti ehf. Nýherji hf. Tölvudeild SC ehf. Tölvuþjónustan á Akranesi ehf.	Voice/data-transmission services and telecommunications networks

As the number of registered telecommunications companies indicates, Iceland Telecom's market share is being assailed from all sides. Some of the parties that have recently obtained authorisation from the Post and Telecom Administration are well on their way to developing their telecommunications networks. Their market entry will step up competition and reduce prices to consumers.

There are some examples of overseas telephone call services being offered in IP format, which have mostly been used by large customers so far. IP telephone technology is regarded as a likely source of growth in the field in the coming years.

Increased competition in data-transmission services is foreseeable in the near future. Reykjavik Energy and Og fjarskipti have developed a fibre-optic network, which already covers a large part of Reykjavík. Although Iceland Telecom's network in this region is even more extensive, much competition can be expected from Reykjavik Energy's network. Og fjarskipti has already brought into use powerful switching facilities for voice-telephone services and facilities for data transmission. Under law, Og fjarskipti, like other telecommunications enterprises, is entitled to link up with users through a connection with Iceland Telecom's local loops. In addition, the Reykjavik Energy network will compete with Iceland Telecom in certain urban areas.

Notwithstanding the fact that Iceland Telecom has an advantage in the market in most cases, it is clear that the company will meet, and has already met, with fierce competition. In the opinion of the Appellate Committee for Electronic Communications and Postal Affairs, for instance, Og fjarskipti has already achieved the strength where it could be subjected to encumbrances as regards interconnection prices.⁵

If the situation does not change, all the indications are that competition in telecommunications networks will mostly centre on the metropolitan area of Reykjavík and be less prominent in rural areas. New transmission networks have mainly appeared in the south-western corner of Iceland, as a certain level of revenue is required for mobile telephone exchanges, fibre-optic cables or fixed-telephone exchanges to serve certain regions.

Worth noting is the *fixed-mobile convergence*. There is already a trend of private users using mobile phones exclusively. This may be expected to increase, as access to data transmission is already being mentioned as one reason why rising numbers of people are using mobile phones exclusively and have cancelled or not obtained fixed-network subscriptions. With increasing data-carrying capabilities of mobile telephones (GPRS and UMTS), such transmissions will increase substantially, which will speed up this trend.

2.4.1.2 Co-operation among enterprises

Enterprises in the Icelandic telecommunications market, like elsewhere, have in some cases entered into partnerships with other companies operating in a similar field. There are also some cases of one telecommunications company owning a share in another.

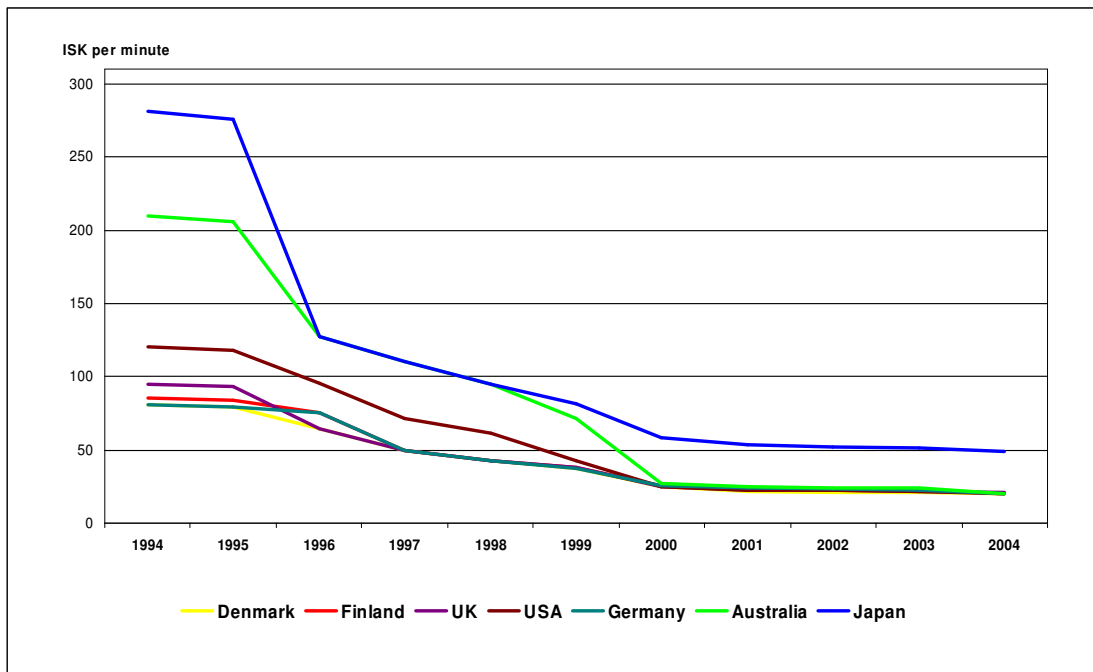
Companies in the telecommunications market that form partnerships or merge improve their competitive position vis-à-vis Iceland Telecom. This means that the number of enterprises will grow more slowly than otherwise, but this is offset by good market access. The merger of Halló – Frjáls fjarskipti, Tal, and Íslandssími created a telecommunications company with significant market power in various areas, and in some service markets there are virtually no competitors other than Iceland Telecom and Og fjarskipti.

⁵ The Appellate Committee for Electronic Communications and Postal Affairs, Case No. 3/2003 of 21 October 2003.

Og fjarskipti is now the principal owner of the media consortium formerly under Norðurljós hf. Og fjarskipti has the strong financial backing of parties including Baugur Group, which has a combined turnover in excess of Iceland's Gross Domestic Product. Og fjarskipti markets itself under the brand of the UK-based telecoms giant Vodafone.

2.4.1.3 Price trends

Prices per minute have fallen substantially in the past 10 to 15 years, which applies to all traffic except fixed-line voice traffic (phone to phone). Prices for international calls have dropped proportionately most, a trend that took place mostly between 1991 and 1996, with little change since around 2000.



**Figure 2-9 Per-minute price trends for calls to key countries
- day tariff based on each year's price levels**

The same applies to domestic traffic. Prices for traffic within Iceland have fallen substantially in recent years, but mostly for traffic related to mobile telephone systems. This applies both to prices for traffic within the mobile systems as well as to other systems. However, prices have been fairly flat for the past three years.

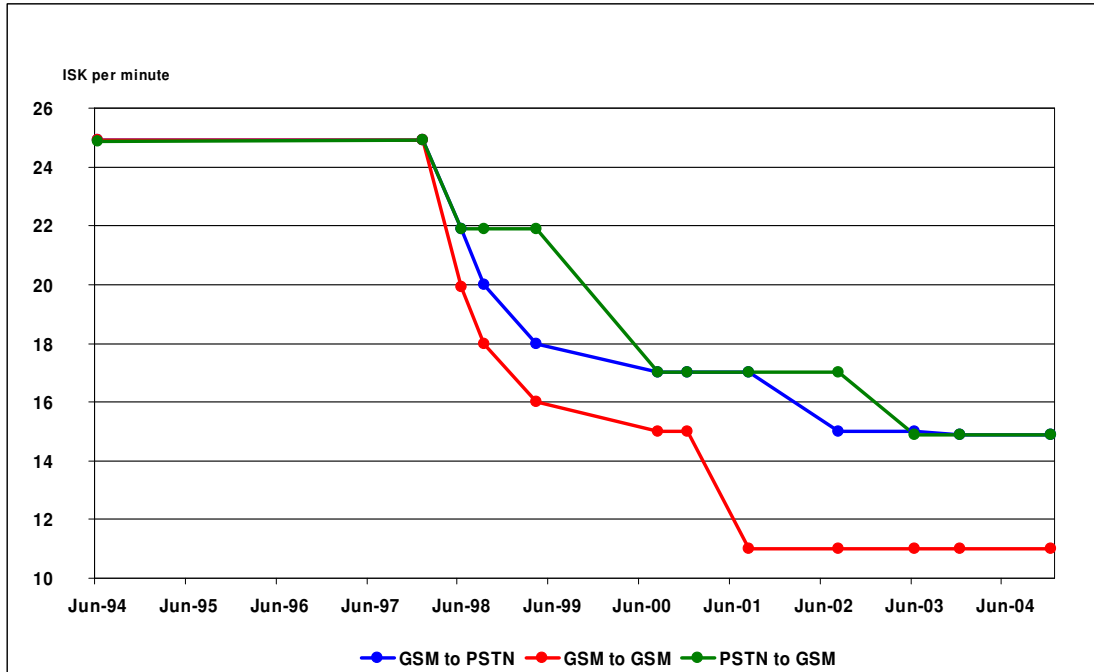


Figure 2-10 Per-minute price trends for key call types – day tariff based on each year’s price levels

The trend for ADSL has been towards increased transmission capacity and lower prices for data transmission. The figure below shows the trend for the past three years. Transmission capacity is shown in columns for three rate categories, and prices are shown in lines.

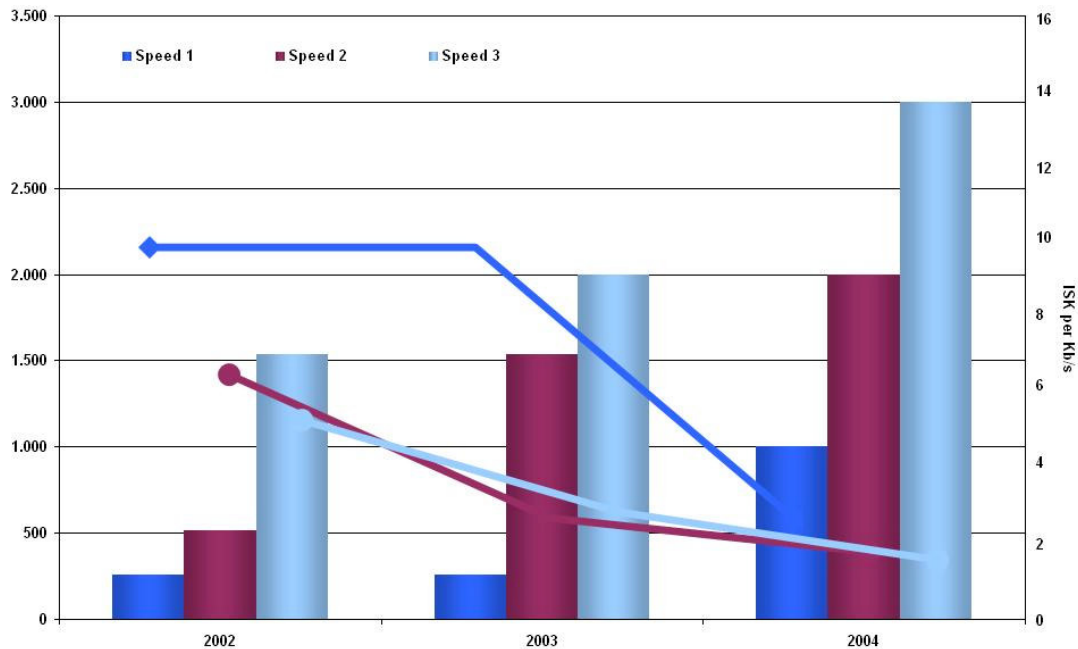


Figure 2-11 Price trends for ADSL connections and data transmission (Kb/s)

2.4.2 International comparison and competition

Icelanders have been quick to adopt new technologies, which includes telecommunications and IT. Thus, Iceland is among the top handful of countries when looking at the number of desk and mobile phones, Internet penetration and the number of PCs. Comparison also shows that tariffs for telecommunications services are among the lowest known. Despite this, Iceland has managed to build state-of-the-art telecommunications infrastructure, as discussed above. Foreign competition is, as yet, minimal.

2.4.2.1 Prices and market

The figures below compare penetration of a number of telecommunications systems and then prices.

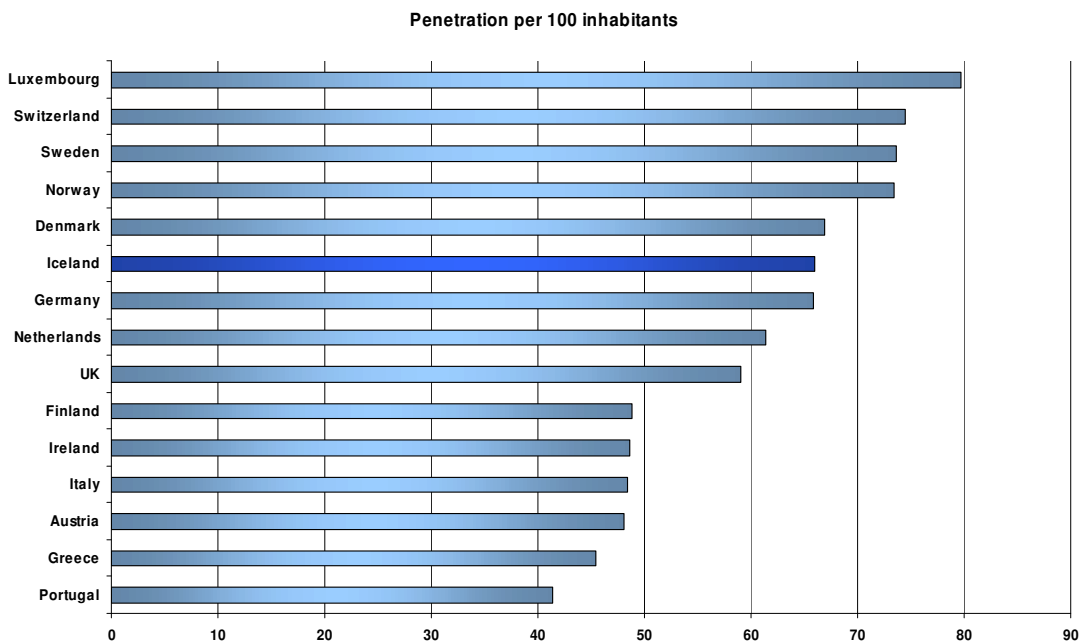


Figure 2-12 Penetration of fixed-line telephone connections

These data from the International Telecommunications Union date from 2003.

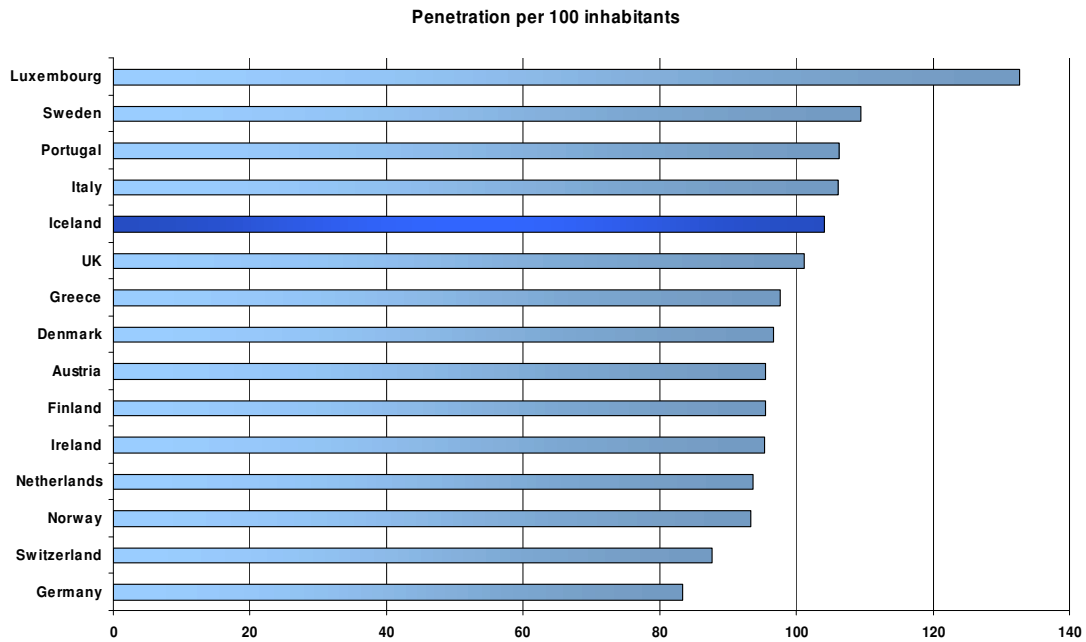


Figure 2-13 Mobile-phone penetration

These data from Mobile Communications date from January 2005.

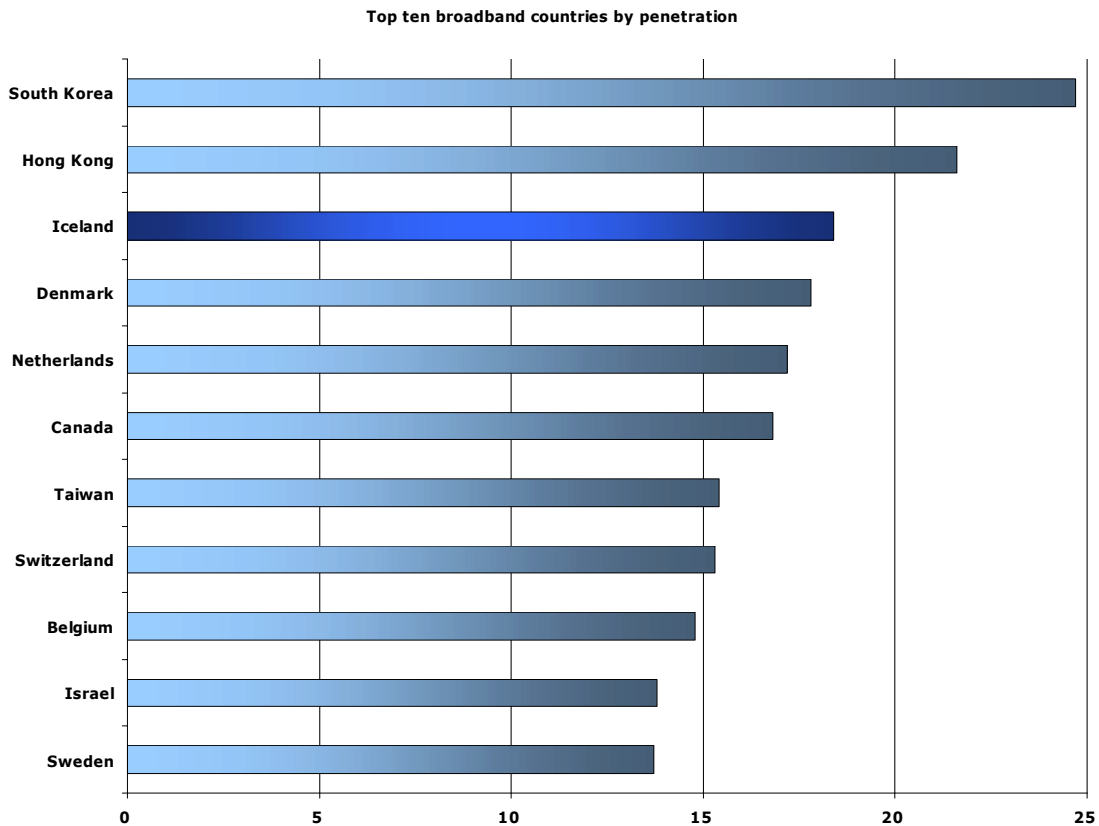


Figure 2-14 ADSL penetration

The above table shows that Iceland ranks third in the world in ADSL penetration, with 18.4 of each 100 inhabitants having ADSL access. The table's figures for countries other than Iceland were obtained from Point Topic, while the figures for Iceland are based on calculations of results in a market survey conducted by ÍM Gallup in June and July 2004.

2.4.2.2 International comparison of service prices

Service prices are a good indication of conditions prevailing in the Icelandic telecommunications market. Prices for telecoms services have generally declined significantly in the past few years, particularly in the fields of mobile-telephone services and international calls. As illustrated by the figures below, prices for Iceland Telecom's services are favourable in international comparison. The figures are based on data from Teligen Ltd, which regularly compares telephone costs in OECD countries.

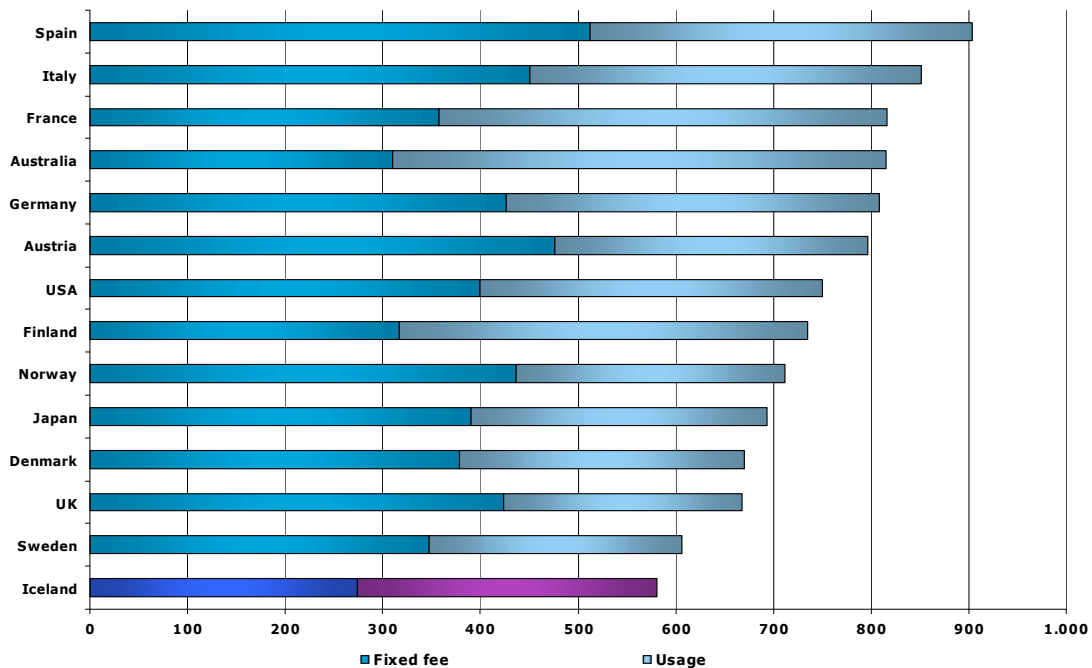


Figure 2-15 Home telephone costs (fixed-line)

Prices include value-added tax and are based on purchasing power in each country and converted into USD, November 2004

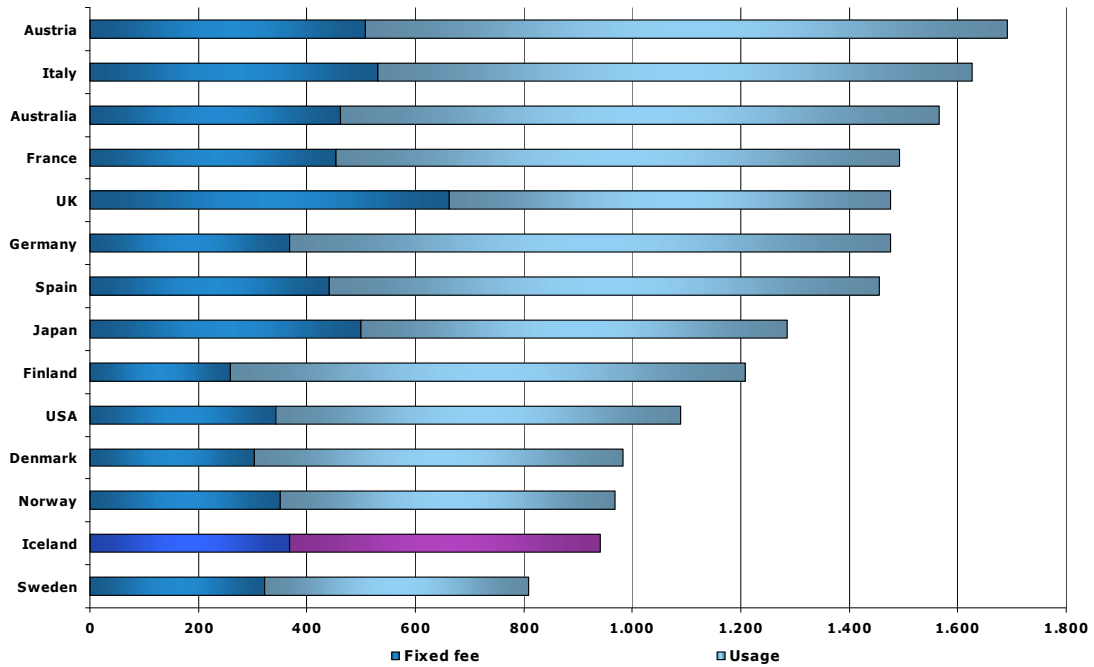


Figure 2-16 Corporate telephone costs (fixed-line)

Prices are exclusive of value-added tax, based on purchasing power in each country and converted into USD, November 2004

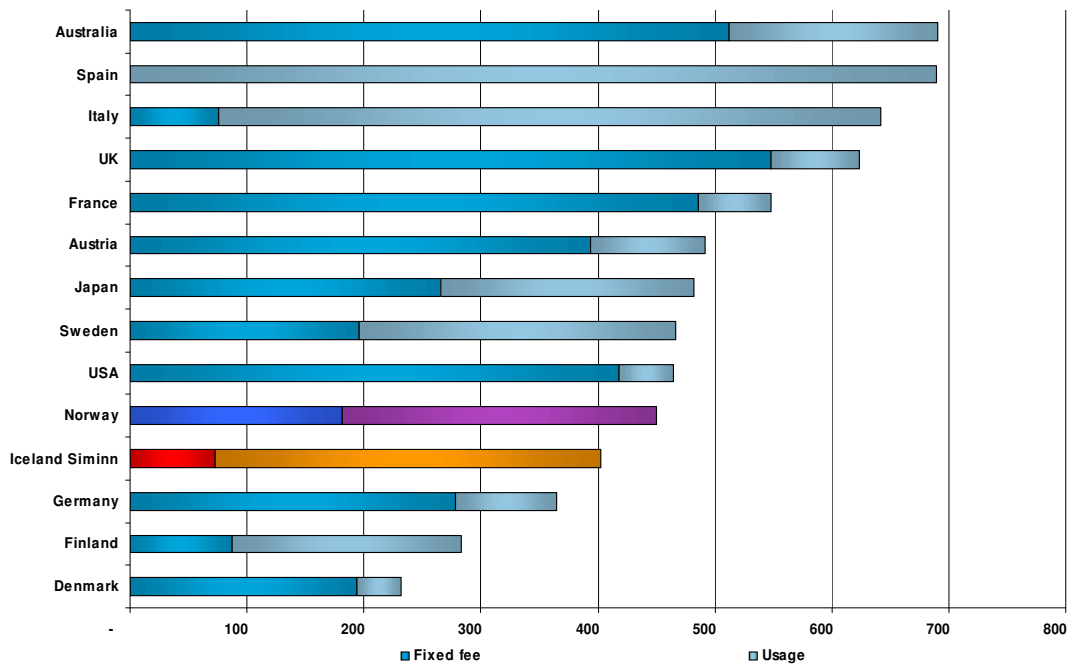


Figure 2-17 Mobile costs based on average use

Prices include value-added tax and are based on purchasing power in each country and converted into USD, November 2004

2.4.2.3 Competition with overseas companies

International competition could manifest itself in different forms. Satellite systems are being developed, which could pose some competition to Iceland Telecom. However, such services will hardly become competitive for a while. The Icelandic fishing fleet has been using Inmarsat services to some degree. Looking longer-term, microsatellites, which are much less costly than the satellites currently in use, may create price competition with Icelandic telecommunications networks.

International telecommunications companies seeking to enter the Icelandic market must build a network or buy access to existing networks. Their interest in the Icelandic market will no doubt be determined by profitability factors. Icelandic competitors will in all probability show interest in collaboration with international enterprises, which would bring them increased know-how and financial strength. As mentioned previously, Og fjarskipti is already engaged in an extensive partnership with the UK-based telecoms giant Vodafone Group, an aspect taken into account by the Appellate Committee for Electronic Communications and Postal Affairs when it designated Og fjarskipti as having significant market power in the interconnection market.

Competition is currently steepest with foreign operators for the sale of international connections. For example, Equant offers specialised services in Iceland for two-way overseas connections. The above table on telecommunications licence holders shows that four foreign companies have licences to operate in Iceland in addition to Equant, which has an office in Iceland.

3. Regulatory Environment

One of the principal viewpoints underlying the sale by the State of its shares in Iceland Telecom hf. is to achieve the objectives established in telecommunications legislation, the current legislation being Act No. 81/2003, which took effect on 25 July 2003.

On the basis of the Telecommunications Act of 1984 and earlier legislation, the State held a monopoly on telecommunication services in the Icelandic market with few exemptions. This State monopoly, however, was restricted by an amendment to the Telecommunications Act in 1993 and applied from that time only to public voice telephony services and the telecommunications network. On 1 January 1998 this monopoly was completely repealed in compliance with obligations imposed on the Icelandic State on the basis of the Agreement on the European Economic Area.

On the basis of legislation enacted in 1996, the Post and Telecom Administration was incorporated as a State-owned limited liability company. This led to the establishment of Iceland Telecom hf. on 27. December 1997. Until the present time, the Company has been largely State-owned.

The Telecommunications Act No. 107/1999 represented yet another important step in the direction of deregulation. One of the main objectives of the legislation was to promote competition in the telecommunications market. Other objectives included securing efficient and reliable telecommunications. The legislation featured various new provisions which placed Iceland among the most advanced countries in the world as regards the liberalisation of telecommunications services. Examples of this include provisions on domestic roaming agreements, number portability and local loop access. The current legislation continues on the same path, increasing still further the freedom of telecommunications services, which no longer requires licensing, the rules of competition law are used in assessing market dominance, the terms of network access and joint use of services have been reviewed and stronger consumer perspectives now apply, in addition to the fact that the legislation contains provisions designed to secure adequate public telecommunications services on reasonable terms. Finally, the Universal Service Regulation defines the minimum service to be made available on reasonable terms in the form of universal service.

3.1 Telecommunications Act

Substantial changes have occurred in world telecommunications in recent years. A milestone was passed in Iceland when the statutory State monopoly on the operation of public telephony services and the ownership and operation of public telecommunications networks was abolished with Act No. 143/1996. At the same time a new Act, No. 147/1996, was enacted establishing the Post and Telecom Administration, which is intended to carry out general administrative functions in the field of postal and telecommunications affairs.

The Telecommunications Act No. 107/1999 took effect on 1 January, together with the Act on the Post and Telecom Administration No. 110/1999. This legislation brought about fundamental changes designed to promote competition in telecommunications and to secure

public access for all Icelanders to a predetermined minimum service referred to as universal service. The option of number portability was opened, enabling users to retain their telephone numbers if they wished to change service providers, provisions on roaming agreements were implemented in cases where the development of a separate own network was seen as unfeasible, telecommunications companies were granted access to the local loops of companies with a significant market share, a step was taken in the direction of abolishing entry barriers for new telecommunications companies into the market by abolishing operating licences for certain types of telecommunications services, and provisions were made for open access to telecommunications networks and an obligation to interconnect telecommunications networks. In spite of the short time from the entry into force of the legislation, obligations pursuant to the EEA Agreement had the effect that it became necessary to review the telecommunications legislation and implement the relevant new EU framework legislation. The following is an account of the principal changes made to the earlier legislation and of the changes which took effect with the new Telecommunications Act No. 81/2003, which entered into force in Iceland on 25 July 2003, the same time that the directives and regulations took effect in the EU Member States.

3.1.1 Earlier Legislation

Extensive changes were made in the regulatory environment of telecommunications enterprises in Iceland on 1 January 2000 with the enactment of a new Telecommunications Act, No. 107/1999, and Post and Telecom Administration Act, No. 110/1999.

As mentioned earlier, the objective of the new legislation was to promote increased competition and to secure access by all Icelanders to minimum service, the so-called universal service, and on the other hand to adapt Icelandic legislation to the new EEA telecommunications directives. The Act focused primarily on the following:⁶

- To meet Iceland's obligations under the Agreement on the European Economic Area;
- To ensure the interconnection of networks so that customers of different telecommunications enterprises could communicate;
- To oblige enterprises owning public telecommunications networks and other infrastructure to open access to their networks and other facilities at reasonable rates;
- To promote real competition in the market by levelling the competitive position of telecommunications enterprises, e.g. through access to local loops;
- To place restraints on dominant companies, e.g. through requirements concerning the segregation of accounts;
- To meet the needs of all Icelanders for a specified minimum service;
- To secure adequate scope for telecommunications enterprises to operate;
- To meet the demands of business to remove obstructions and simplify the regulatory framework and reduce its scope as competition increased;
- To secure the access of government authorities to necessary data from the market in order to enable the establishment of general rules;
- To ensure the continued existence of strong telecommunications enterprises in Iceland;
- To prevent legislation from impeding the progress in information technology and obstructing technological advances.

⁶ Legislative bill on telecommunications. Submitted at the 125th session of the Althing. Parliamentary Document No. 143. Issue No. 122.

The legislation implemented a package of several Community telecommunications directives and decisions which replaced an earlier Community directive. The objective was to streamline the complex regulatory framework of telecommunications and at the same time to bring it better into line with competition law. At the same time, the number of acts was reduced by combining their substance.

The legislation involved various innovations which had a substantial impact on the operating conditions of Iceland Telecom hf.; the principal changes are described below.

3.1.2 Number Portability

The first provision deserving mention involves number portability and carrier selection and carrier pre-selection. Number portability makes it possible for telephone users to retain their telephone numbers regardless of service provider. In order to make use of carrier selection, the user selects a prefix before the regular telephone number and thereby gains access to a service provider. Applying for carrier pre-selection enables subscribers to omit the prefix for access to a service provider. Both number portability and carrier selection are regarded as essential for competition in telephone services.

In accordance with the rules of the Post and Telecom Administration on number portability, portability in the fixed network came into effect on 15 September 2000. Number portability between all number areas in the country came into effect on 15 February 2001 and number portability in the mobile telephone networks has been offered since 1 October 2004.

The Post and Telecom Administration has also issued rules on prefixes, whereby business can be directed to a specific telecommunications company, and pre-selection, whereby certain services are always directed to a specific telecommunications company, in voice telephony networks in order to implement the provisions of the Telecommunications Act concerning prefixes. Subscribers to the fixed telecommunications network have had the option of ordering preselection services since 1 April 2000.

Number portability leads to stiffer competition, as end-users will find it easier to transfer their business to other telecommunications enterprises when the transfers do not require changes in telephone numbers.

3.1.3 Roaming Agreements

Second, the legislation provided for domestic roaming agreements. This means that mobile telephone companies must have access to the mobile telephone networks of other mobile telephone companies where it is not feasible to establish and operate a mobile telephone exchange owing to the nature or scope of investment, or where the conditions for the establishment and operation of a mobile telephone exchange are particularly difficult. The provisions of the Telecommunications Act on roaming agreements took effect on 1 January 2001.

Iceland Telecom offers the telecom enterprise Og fjarskipti access to its mobile telephone exchanges in various rural areas where the latter company has not developed its own mobile network. The roaming agreements are based on free negotiation between the mobile phone

companies, which on 2 March of this year concluded a new roaming agreement for two years with effect from 1 January 2005.

Domestic roaming agreements may bring about more effective competition in mobile telephone services across the country. The provisions of the Telecommunications Act concerning roaming agreements have the disadvantage, however, that their implementation reduces the incentive for Iceland Telecom to develop mobile networks in rural areas.

3.1.4 Access to local loops

Third, access to local loops was guaranteed by law. Access to local loops means that telecommunications enterprises may, on fulfilling certain conditions, be legally entitled to lease access to the local loops of companies holding a significant market share (approximately 25%; this criterion changed with the new law and is determined by dominant market position pursuant to the criteria of competition law). On the basis of the Act, the Post and Telecom Administration would have been able to decide, as of 1 October 2000, that telecommunications enterprises should be granted direct access in this way to individual customers. The decision was made to bring together a working group of the telecommunications companies to address this matter; the working group returned a consensus on rules of procedure for local loop leasing and collocation in January 2001.

This obligation resulted in changes for Iceland Telecom. Without this provision new telecommunications enterprises would have had to construct their own networks to obtain direct access to users. The local loop access stimulates competition in the consumer market throughout the country. A new reference offer for access to local loops is now posted on the company website with effect from 1 April 2005.

However, Iceland Telecom's competitors, Og fjarskipti hf. (previously Íslandssími hf., Tal hf., and Halló – Frjáls fjarskipti hf.) and Reykjavík Energy have started on the development of their own infrastructure with local loops to larger customers.

3.1.5 Reduced Government Interference

Fourth, the legislation generally reduced state interference with telecommunications enterprises, and facilitated the access of individuals and enterprises to the market. The general principle was now that no special licence was required to operate telecommunications enterprises, except for the operation of voice telephony services, mobile telephone services and telecommunications networks. The result was that the number of Iceland Telecom competitors grew.

3.1.6 Open Access to Networks

Fifth, the telecommunications legislation provided for the rights and obligations of telecommunications enterprises, e.g. as regards open access to telecommunications networks and interconnection. These provisions underlined the obligation of Iceland Telecom and other operators of public telecommunications networks to provide competitors with access to their networks. The Post and Telecom Administration could now decide, following an arbitration process, that the tariff of an operator of a public telecommunications network with significant market power should be based on cost, including return on capital. Telecommunications enterprises were entitled, and under obligation, to negotiate interconnection among

themselves. The general principle became that contracts on technical and business issues should be reached based on free negotiation among the parties in question. For a long time Iceland Telecom was the only enterprise with a significant market share in Iceland, but in 2003 the Post and Telecom Administration designated the telecommunications enterprise Og fjarskipti as having a significant market share in mobile telephone services and by a decision of the Ruling Committee for Telecommunications and Postal Affairs the enterprise was also designated as having such a market share in the interconnection market. Enterprises with a significant market share must observe rules of non-discrimination and must not give preferential treatment of any kind to their own divisions or subsidiaries over other companies. All their tariffs must be based on cost and reasonable profit margins. If a contract cannot be reached through free negotiations, either party can refer the issue to the arbitration of the Post and Telecom Administration, which can propose a compromise. If an agreement is not reached within three months, the Administration shall, at the request of either or both parties, determine the conditions for interconnection and provide a reasoning for its decision.

3.1.7 New Telecommunications Legislation

Communications and information matters are of crucial importance to Iceland. The objective is to place Iceland at the forefront of technologically advanced nations as regards inexpensive quality telecommunications service. Parliament and government authorities are responsible for ensuring fair rules in telecommunications, rules which will contribute to increased welfare and prosperity. The rules of the game in telecommunications are in many ways different from the rules that apply in other industries, *inter alia* as a result of the special position of telecommunications in Europe rising from the fact that they have only in recent years been freed from monopolistic protection, and for this reason it has not been regarded as a timely measure as yet to bring certain aspects of telecommunications services, such as interconnection, cost separation of telecommunications enterprises, rules on open access to networks and universal service, under the legislation governing competition. Further examples include regulation of frequencies and allocation of numbers.

The Post and Telecom Administration is a regulatory body charged with shaping a competitive environment in a market where state-owned telephone entities have for decades owned and operated the only comprehensive telecommunications network in existence until the monopoly was ended by law. The changed regulatory environment and the activities of a professional regulatory body has made it possible for new enterprises to enter the market.

Trends in overseas telecommunications markets have had an impact on Icelandic telecommunications enterprises, some of which have needed to reduce the scope of their operations. Thus, two of the companies which in the year 2000 were granted a licence to operate a GSM mobile telephone service in the 1800 MHz frequency range have not started up their operations and other enterprises have reduced their investments in telecommunications services. The attitudes to telecommunications and the potential benefits of investing in the industry have become more realistic than before. One consequence of this is the reduction in the number of telecommunications enterprises. The most prominent example is that several of Iceland Telecom's principal competitors, i.e. Íslandssími hf., Halló – frjáls fjarskipti hf. and Tal hf., have merged into a single company, Og fjarskipti hf., which means that there are now only two telecommunications enterprises in Iceland offering comprehensive telecommunications services to individuals and enterprises, although a

number of telecommunications enterprises are offering more specialised services. It is therefore necessary for the telecommunications regulatory environment to be organised so as to make it possible for new stakeholders to enter the telecommunications market and compete with existing enterprises.

3.1.8 Community Telecommunications Legislation

New European telecommunications legislation entered into force on 25 July 2003. The legislation was presented as a package of several directives and a Decision of the Parliament and Council which replaced most of the existing telecommunications directives. The objective was, again, to reduce the complex regulatory framework of telecommunications activities and at the same time to bring them better into line with competition law. At the same time, the number of acts was reduced and their substance was integrated. The acts in question are the following:

- Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive).
- Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive).
- Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).
- Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).
- Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).
- Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision).

The five directives fall within Article 95 of the Treaty of Rome, but in addition the Commission, with reference to Article 86 of the Treaty, issued Commission Directive 2002/77/EC of 16 September 2002 on competition in the markets for electronic communications networks and services. These acts have EEA relevance.

Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity will continue in force. The provisions of Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop will continue in force, but is scheduled for early revision to take account of market conditions.

3.2 New Telecommunications Legislation in Iceland

The new EU telecommunications legislation was incorporated into the domestic legal order in Iceland through the enactment of the Telecommunications Act No. 81/2003 simultaneously

with the entry into force of Community directives and regulations in EU Member States; at the same time new legislation came into effect on the Post and Telecom Administration with Act No. 69/2003.

3.2.1 Purpose of the Legislation and Principal Changes

From the time that the state monopoly on telecommunications activities was lifted, the principal objective of telecommunications legislation has been twofold: on the one hand to promote effective competition, and on the other hand to ensure general public access to a minimum standard of telecommunications services. Separate telecommunications legislation is seen as a necessary measure to achieve these objectives. In order to ensure the progress of the telecommunications market as a competitive market and secure telecommunications services for all Icelanders, the following amendments were among those proposed in the Act of 2003.

1. An operating licence is no longer required to engage in telecommunications activities; instead, telecommunications enterprises will operate in accordance with general authorisation.
2. Assessment of whether an enterprise has a significant market share is based on the rules of competitive law relating to the assessment of dominant position instead of the 25% market share of earlier legislation.
3. The formal merger of telecommunications and broadcasting is confirmed with the result that the legislative Bill contains rules on broadcasting.
4. Authorisation is granted to mandate the distribution of certain broadcasting programmes.
5. There are more detailed provisions than before concerning protection for the users of telecommunications services.
6. The right of users to a minimum level of telephony and data transmission services in the universal service is secured, and proposals are made for improvements in the Price Equalisation Fund, which is responsible for payment for unviable universal service.
7. Conditions for access to networks are revised.
8. More explicit rules are established concerning joint use of facilities.

3.3 Equalisation Measures in Telecommunications Services

The rapid development of the telecommunications market and international trade is driving the privatisation of Iceland Telecom and the withdrawal of the State from direct participation in business activities in competition with private enterprises. Only through the sale of its stake in Iceland Telecom will the State be able to bring about a normal working environment for the company and other competitors in the telecommunications market. Legislation and efficient regulation, not the operation of its own enterprises, are the proper means for the government to prevent discrimination and promote progress.

Instead of seeking to achieve social telecommunications objectives through the operation of a state-owned enterprise, their achievement will be secured through the new telecommunications legislation. Unequivocal legal provisions will enable government authorities to implement equalisation measures irrespective of ownership. On a foundation of strong private enterprise and competition in telecommunications services the State will be able to secure the attainment of social objectives through procurement and free contracting in an inexpensive and efficient manner.

3.3.1 The Telecommunications Act

Chapter VI of the Telecommunications Act clearly provides that the State must undertake to secure, to the extent possible, access for all citizens to telecommunications services. The Act also lays down certain social objectives and the means to be used to achieve them. These objectives relate to certain important telecommunications services, the supply of which should not be based purely on commercial viewpoints. These are services relating to law enforcement and security as well as services that the government wants citizens to have access to at subsidised rates owing to special circumstances, e.g. owing to residence at a distance from urban areas. Article 19 of the Telecommunications Act is as follows:

All users shall be entitled to universal service, regardless of location, with the exceptions listed in the second and fourth paragraphs.

If it is considered necessary to ensure satisfactory electronic communications services at moderate prices and such services cannot be provided if only commercial aspects are considered, the Post and Telecom Administration may instruct an electronic communications undertaking which operates a public electronic communications network or electronic communications services to provide universal service in its area of operation. The Post and Telecom Administration may in special instances grant service providers an exemption from this provision

Universal service shall include telephone service, manual service and service to disabled or users with special social needs and data transmission service with a capacity of 128 Kb/s. The Post and Telecom Administration shall furthermore ensure that users have access to at least one comprehensive telephone directory of all subscribers and comprehensive directory enquiry service. The Post and Telecom Administration may place obligations on electronic communications undertakings to set up and operate public pay telephones and may decide upon their location.

If an electronic communications undertaking does not feel able to provide certain parties with universal service, as provided for in the first paragraph, for instance, due to distance, cost or other difficulties, any dispute concerning this refusal shall be sent to the Post and Telecom Administration for a decision.

The Post and Telecom Administration may set minimum quality requirements for universal service.

If a telecommunications enterprise is of the opinion that a universal service which it is under obligation to provide is operated at a loss or is unprofitable, it may apply for reasonable remuneration for the service in question pursuant to Article 21 of the Act through financial contributions.

The Act specifically provides that the same tariff must apply to universal service throughout the country. This is an encumbrance placed on all telecommunications companies entrusted with the provision of universal service in order to underline that they are not permitted to impose a special charge for long-distance calls.

In addition to the imposition of an obligation to provide universal service, the Post and Telecom Administration imposes special conditions on authorisations for telecommunications pursuant to Article 6. Furthermore, the Minister for Communications may instruct the Post and Telecom Administration to contract with a telecommunications enterprise for undertakings or operations for the public benefit, for security reasons, or due to environmental considerations or regional interests pursuant to Article 23.

The Telecommunications Act provides that data transmission services, and not only telephony services, must form a part of the universal service. In this way, the government is seeking to ensure for all citizens a certain level of data transmission service and thereby improve their

access to the Internet. In this regard, the Icelandic government has gone further than most other states, although the provision is modelled on the Danish telecommunications legislation.

3.3.2 Financing

The Telecommunications Act provides for funding for equalisation measures by two methods, i.e. by an equalisation charge imposed on all entities providing a certain service, and, finally, by contributions from the State Treasury.

First, there is telecommunication service which has an extensive relevance for users in the telecommunications market, e.g. the emergency number service. In such cases funding through a special equalisation charge may be appropriate; the charge is then imposed on the telecommunications enterprises working in the relevant field of service in proportion to the extent of the business, as stipulated in Article 22 of the Telecommunications Act. The service is for the benefit of all, or virtually all, telecommunications users, and it is therefore natural that they should carry the cost in proportion to the use.

Second, there is specialised service which is best funded by general tax levies rather than an equalisation charge, such as special telecommunications services for seagoing vessels. Another example could be the imposition of an obligation to maintain a certain level of telecommunications in a remote area which, owing to its extent would amount to a pure regional residence grant. It appears safe to say, therefore, that when state intervention has little significance for the general users of service there is much to recommend direct contributions from the Treasury, since a high equalisation charge would serve to reduce telecommunications and impede normal business. The equalisation charge is also a turnover tax which, like other turnover taxes, could have a negative impact on divisions of labour and, if taken too far, undermine the competitive position of Icelandic telecommunications enterprises.

The equalisation charge is currently 0.12% of reported turnover pursuant to Paragraph 3 of Article 22 of the Telecommunications Act, but funding needs are subject to annual review and proposals for changes to the provision on the charge are envisaged if funding needs change substantially. Costs which can be attributed to decisions of the Minister for Communications concerning developments or operations relating to security matters, environmental matters or regional matters should normally be paid out of the Treasury. One of the tasks of the Post and Telecom Administration is to supervise contracting with telecommunications enterprises for services of this kind following calls for tenders.

The Act is intended to ensure that operators can claim reasonable remuneration for the universal service they are required to provide and thereby that the subsidies are financed by general public means and not exclusively by their own customers (i.e. those customers who do not require subsidy or support). In this way the legislation attempts to ensure equality among operators and a minimum disruption of competition as a result of equalisation measures.

3.3.3 Equalisation Measures in the Icelandic Telecommunications Market

The Communications Minister has issued a government regulation on universal service pursuant to the Telecommunications Act; the current version is No. 641/2000. The regulation has the purpose of providing in further detail for the authority of the Post and Telecom

Administration and the rights of the public. Among other things, the Post and Telecom Administration is authorised to insert provisions in licences granted to operators concerning the obligation to provide universal service. The Administration must ensure that at least one licensee provides each type of universal service. Universal service obligations may be divided among two or more licensees. Universal service obligations must be limited to a specific term.

In the conditions prevailing in Iceland immediately following the liberalisation of the telecommunications market, the Post and Telecom Administration regarded it as a certainty that Iceland Telecom would be instructed to provide universal service to some degree. Article 28 of the revised licence issued to Iceland Telecom on 5 June 2001 and reprinted with amendments on 23 January 2003 contains the following provision on the universal service obligation:

Pursuant to Article 4 of Regulation No. 641/2000 on Universal Service, the voice telephony service of the licensee is governed by the obligations laid out in the regulation on universal service.

All citizens are entitled to universal service, regardless of residence, unless the distance from the nearest local loop connections in the telecommunications network of the operator is greater than 10 km, or if costs are expected to be particularly substantial. A licensee is required to accede to requests for a voice telephony connection from applicants when a network is available at the location where a telephone is requested. The request must also be granted, even if a new line needs to be laid, provided that one of the following conditions is met:

- a) An applicant requesting a residential telephone has shown that he is domiciled at the location where the telephone is requested and has issued a statement declaring his intention to be permanently domiciled at that location for at least 1 year following the submission of the application.
- b) An applicant requesting a telephone for professional use has shown that his company is legally registered at the location where the telephone is requested and has issued a statement declaring that the company will be operated at that location for at least 1 year.
- c) An applicant has shown that a telephone at the relevant location is necessary in order to ensure public safety.

A licensee is not required to provide more than two lines to a residence and is furthermore authorised to limit the number of lines to a company if it can be shown that the normal needs of the company will be met despite the limit.

Any dispute between the licensee and the applicant may be referred to the Post and Telecom Administration. The Post and Telecom Administration is entrusted with planning the location of public pay-telephones in municipalities in co-operation with a licensee who has been made responsible for this aspect of universal service. Following consultations with Iceland Telecom, the Administration decided in January 2001 on the arrangements of the operation of public pay phones in Iceland.

The new Telecommunications Act secures a certain framework and certain channels for social objectives and government equalisation measures. This ensures efficient implementation and

minimum disruption of development and business in the telecommunications market. However, the extent of establishing targets and taking measures of this kind will always be political issue.

It is important that equalisation measures in the telecommunications market should be well defined and that the costs involved should not be hidden, e.g. by means of conditions and prohibitions, without ensuring a reasonable charge for the activities involved. Experience has shown that the risk of inefficiency and hidden costs is multiplied where the government attempts to achieve its equalisation objectives by operating its own enterprises. All prioritisation becomes difficult and the risk of waste and inefficient implementation increases, as it is impossible to find the simplest and cheapest solutions if the cost is hidden. In many cases, and when a certain point is reached, it may be more effective to channel the support directly to the persons who will benefit rather than restrict the operating conditions of enterprises providing a service.

3.4 Authorisation for Telecommunications Activities

In the Telecommunications Act No. 81/2003 telecommunications enterprises are no longer required to apply for an operating licence. In normal circumstances it is sufficient to notify the Post and Telecom Administration of the proposed telecommunications activity. The Post and Telecom Administration keeps a register of active telecommunications enterprises. There are currently 55 registered telecommunications companies.

Telecommunications enterprises requiring frequencies or numbers for their activities need to apply for a use permit to the Post and Telecom Administration. However, there are certain frequency ranges that anyone may use and for which no specific applications are required. Several Icelandic telecommunications enterprises operate wireless data transmission connections in such frequency ranges.

Restrictions on the number of frequency permits are not permitted except when necessary to ensure the efficient use of frequencies. The number of licensees has been limited in mobile telephone services and wireless data transfer connections in certain frequency ranges. In such cases, frequency permits are allocated following advertisement or calls for tenders, with the cost of the allocation paid by the applicant granted the frequency permits.

Telecommunications companies are required to pay an annual operating fee corresponding to 0.2% of their reported turnover, i.e. the turnover of the licensee from licensed operations in Iceland. This charge is intended to cover the operating cost of the Post and Telecom Administration.

An annual fee is levied on telecommunications companies for allocated telephone numbers. The charge is ISK 10 for public telephone numbers, ISK 200,000 for four-digit numbers, including prefixes and network codes, and ISK 1,000,000 for three-digit numbers.

The Post and Telecom Administration establishes conditions applicable to general permits for telecommunications activities, and, in addition, special conditions may be imposed for permits to use frequencies and numbers. In special circumstances, e.g. owing to legislative amendments, the Post and Telecom Administration can amend permit conditions. Such amendments shall be announced with reasonable notice. The Administration is also authorised

to stop, withdraw permits or lay down conditions for business activities if they do not comply with the provisions of law or the conditions of permits. Obviously, such authorisation is exercised in moderation, and telecommunications companies are given an opportunity to express their views before such recourses are adopted. Also, the Post and Telecom Administration may impose day fines on telecommunications companies which do not comply with the conditions imposed on them or other requirements resulting from the telecommunications legislation. The rights of enterprises to protest must be taken in to account before such recourses are adopted.

3.4.1.1 Licence of Iceland Telecom

The licence for Iceland Telecom was originally issued on 30 July 1998. Following the entry into force of the Telecommunications Act No. 107/1999 changes were made to the licence, which was reissued on 5 June 2001. The most recent amendments to the licence date from 23 January 2002, when a new sub-paragraph, Sub-Paragraph (a), was added to Article 27, concerning unusual measures. According to the provision, it is prohibited to reduce the total assets of the licensee or take any other unusual measures which significantly curtail its ability to fulfil its obligations pursuant to law and the licence.

On the basis of its current licence, Iceland Telecom is permitted to operate a public telephony service, NMT mobile telephone service, GSM 900-mobile telephone service and DCS 1800 mobile telephone service (also known as GSM 1800 service). In addition, there is a separate chapter in the licence dealing with leased lines and a chapter with general provisions. The following is a discussion of the principal aspects of the licence.

The licence prohibits Iceland Telecom from holding direct or indirect interests in any enterprise of any other telecommunications enterprise operating in a sector where the number of licensees is limited for technical reasons. The licence assumes that Iceland Telecom is holding a significant market share in all the sectors covered by the licence (see below), public telecommunications networks and interconnection of networks.

The aspects covered by the licence are the following:

- a) Voice telephony services
- b) Telex services
- c) Transmissions of radio signals between two locations
- d) NMT 450 mobile telephone services
- e) GSM 900 and 1800 (DCS 1800) mobile telephone services
- f) Data transmission services
- g) Public shore station services
- h) ISDN services
- i) Telegraph services
- j) Leased-lines services
- k) General aviation telecommunications services

The licence also contains detailed provisions on the separation of accounts in the operation of Iceland Telecom. Thus, the operation of all networks or parts of networks which are either used for more than one service or to which access is leased to others must be kept separate from other operations. The accounts must be organised so that the cost of operating a network or part of a network can be allocated to the relevant service, leasing activities or network

access in line with the services covered by the licence. Furthermore, the licence specifically stipulates separation of accounts as regards universal service and the cost of interconnection with the networks of other telecommunications enterprises; it is also provided specifically that information services relating to telephone numbers and the publication of a telephone directory must be kept separate, respectively, from other activities of the licensee. Finally, it is stipulated that if the Licensee engages in any other activities which do not constitute telecommunications, such activities shall be kept separate in the accounts from the activities covered by this Licence. The provisions on accounting separation are also contained in the Telecommunications Act, the Universal Service Regulation and Regulation No. 960/2001 on Accounting Separation in Telecommunications. It is specified that the licence is non-transferable.

The licence contains further provisions on telephony services, NMT services and mobile telephone services (GSM 900 and DCS 1800). The section on voice telephony contains provisions on universal service obligations, coverage terms and universal service tariffs, public pay-hones and special needs with reference to the universal service regulation. As regards NMT and mobile telephone services there are provisions on scope, coverage, standards, minimum quality requirements, terminal equipment, frequencies etc.

Finally, the licence contains a separate chapter on leased lines, their scope, tariffs, connection with public networks, terminal equipment, cost accounting, disclosure requirements etc.

According to Paragraph 1 of Interim Provision I attached to the current Telecommunications Act No. 81/2003, the Post and Telecom Administration was to amend telecommunications licences and general authorisations in effect at the time of the enactment no later than 25 July to bring them into compliance with the Act. Iceland Telecom inquired in a letter dated 18 February 2004 how the Post and Telecom Administration intended to implement this legal requirement, pointing out the urgency of removing all uncertainty in light of the proposed sale of the company. In a letter dated 25 February 2004, the Post and Telecom Administration stated its intention that the said amendment should have the minimum impact on the rights and obligations of Iceland Telecom.

Subsequently, on 26 March 2004, the Post and Telecom Administration sent for comment, on the one hand, its draft for new rules concerning authorisation for telecommunications, and, on the other hand, drafts for:

- 1) Authorisation for the use of frequencies for GSM mobile telephone service, 2) Authorisation for the use of frequencies for NMT 450 mobile telephone service, 3) Instructions on the provision of universal service, and 4) Obligations concerning access and interconnection.

Iceland Telecom submitted its comments on the draft rules on general authorisation in a letter dated 28 April 2004. On 3 May 2004 Iceland Telecom submitted its comments on the other four cited documents. However, the Post and Telecom Administration has yet to issue all the above documents and rules, which creates some uncertainty as regards the company's licence and the said rules on general authorisation.

3.5 Access to Telecommunications Networks

3.5.1 Access to Local Loop

Access to Iceland Telecom's local loops is important to promote competition in the public market in Iceland. The following is a discussion of the provisions of telecommunications legislation intended to secure such access. In the current Telecommunications Act, a local loop is defined as a connection from a distribution frame of an exchange in a public telecommunications network to equipment providing access to the residential telephone installation of a subscriber. The local loop can be illustrated as follows:

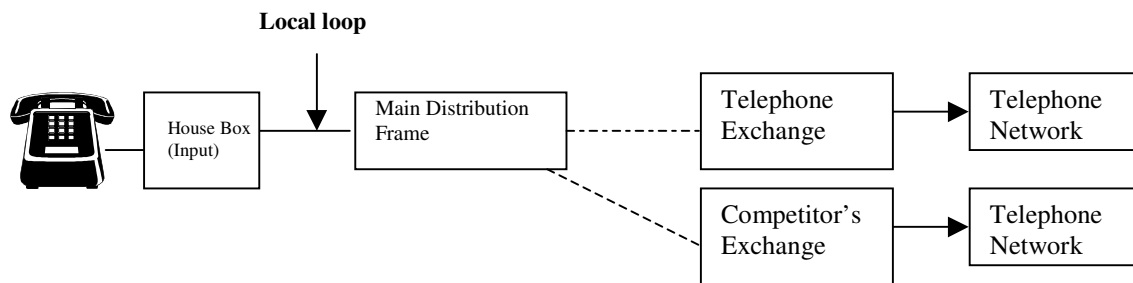


Figure 3-1 Local Loop

3.5.2 Definition of Local Loop

In the current Telecommunications Act, a local loop is defined as a connection from a distribution frame of an exchange in a public telecommunications network to equipment providing access to the residential telephone installation of a subscriber.

Leasing of local loops and their tariffs must be seen in the context of other use of the network, including telephony services and leased lines. For various reasons, fixed charges for telephony services had not followed the general price trends of recent decades, but this had been ignored owing to the substantial profit from long distance and overseas charges. The decision of the Althing in 1996 to make the entire country into a single tariff area and the competition for overseas telephone calls has changed this position, however, and it is neither tenable nor reasonable for competition reasons to subsidise one aspect of telephony services with the income from other aspects. In line with the changed circumstances temporary provisions in the Telecommunications Act No. 107/1999 placed an obligation on the Post and Telecom Administration to decide a fixed telephone charge on the basis of cost accounts to be submitted by Iceland Telecom no later than 1 March 2000. On 1 April 2000, a decision was made on a new fixed charge, but as the increase was substantial the decision was made that it should be implemented in two stages. The charge for the local loop is one part of the fixed telephone charge, but in addition the charge is intended to cover the cost of part of the automatic exchanges to which users are connected, including the so-called user level and distribution frame and other aspects of telephony services, e.g. invoicing, complaints processing and repairs.

These provisions of the Telecommunications Act are in line with Community Directives which are relevant to the European Economic Area, as the EU Commission had instructed that the adjustment of the telephony charge should be completed prior to 1 January 2000. It

should also be noted that local loop lease must remain in line with the fixed charge, calculated based on with cost.

According to the 1999 act, the provision on local loop access entered into force six months following the decision on a new fixed charge, i.e. on 1 October 2000. The objective of the legislature in Iceland, as in the European Union, is to level the position of telecommunications enterprises, as Iceland Telecom and other incumbents in Europe built up their networks during the time that a monopoly was in place and that the networks have to a large extent been amortised.

The European Parliament and the Council passed a Regulation on 5 December 2002 on unbundled access to the local loop and connected facilities. The regulation concerns the obligation of operators with a significant market share to employ a non-discriminatory approach as regards use of the public telephone network and to provide competitors with high-speed access and transmission services on the same basis as to their own service departments to their associated companies. Operators with a significant a market share are required to publish an adequate reference offer for access to the local loop and related facilities. The operator is required to meet reasonable requests for access under transparent, fair and non-discriminatory conditions. Requests shall be met in an equivalent manner as requests from their own services or their associated companies, and with the same conditions and time frames. All charges shall be decided on a cost-oriented basis. Regulatory authorities shall have the power to require changes in the reference offer, including its charges, where justified. This Regulation was incorporated into the legal domestic order by an amendment to Article 20 of the Telecommunications Act in December 2001 and by Government Regulation No. 199/2002. Iceland Telecom published a reference offer for access to the local loop in May 2003. An amended reference offer has now been presented to telecommunications operators, which took effect on 1 April 2005. At the same time, the charge of access to local loops rose by 4.5%. This adjustment in price has been approved by the Post and Telecom Administration.

The decision on the fixed charge for telephone services is, as previously outlined, based on cost accounts submitted by Iceland Telecom. It was concluded by the Post and Telecom Administration that the appropriate fixed charge for voice telephone services should be ISK 1275 per month. No difference was seen in the cost of telephones for professional and private use, but because the charge for professional use has traditionally been double the charge for private use, it was regarded as impossible to take the step of full equalisation at this time. In the second stage of increasing the fixed charge at the turn of 2000/2001, the charge for professional use was set at ISK 1667 per month, while the charge for private use was set at ISK 1111. As of 1 February 2005, the monthly charge for a private telephone is ISK 1345 (incl. VAT), and the monthly charge for a telephone for professional use is ISK 1845 (incl. VAT).

These amounts represent a ceiling for the local loop lease, since the fixed charge for voice telephone service, in addition to the local loop and distribution frame, includes factors such as invoicing, complaints processing and repairs. In December 2002, the Post and Telecom Administration authorised a 9% increase in the closed loop lease and fixed charge. In addition, the Post and Telecom Administration has authorised an increase of 4.5% in local loop lease and leased lines as of 1 April 2005.

The regulation on unbundled access to local loops states explicitly that it should be possible to lease part of the transmission capacity of the local loop. This refers in particular to xDSL technology in data transmission and internet services. In ADSL and other variants of high-speed connections the local loop is used for data transmission at the same time as it serves its original function of transmitting voice signals to and from users. There is, for example, nothing to prevent Iceland Telecom from continuing to use the local loop for voice telephony at the same time that another telecommunications operator provides ADSL services to the same user in the local loop. A division was decided of the local loop cost between xDSL connections and voice telephone services in the preparation of the reference offer, and the monthly charge has been set at ISK 862 for the voice telephone aspect and ISK 285 for the data transmission aspect as of 1 April 2005.

A related matter is the lease of facilities in the exchange of Iceland Telecom for the use of telecommunications companies leasing local loops, as they need space for their equipment in order to be able to make use of the local loops. In some cases, telecommunications operators can lease facilities in the vicinity of the Iceland Telecom telephone exchange, but often this is impossible and facilities on the premises of the telephone exchange are necessary to be able to utilise the local loop. The provision of facilities may be a more difficult matter than the lease of the local loop, and there can be situations where an extension has to be built to the telephone exchange or a separate building erected on the same site for this purpose. The reference offer contains terms relating to facilities connected with local loop lease.

3.6 Provisions of Law concerning Service Tariffs

The Telecommunications Act contains provisions on the calculation of service tariffs for different units in operators' telecommunications networks. It also provides for methods of regulation and disclosure concerning tariffs.

3.6.1 Voice Telephony Service

Pursuant to the Telecommunications Act, the same tariff shall apply to universal service everywhere in the country for each respective operator. The Post and Telecom Administration must also be sent a notice of any new and amended terms and tariffs. The Post and Telecom Administration may decide the maximum price of universal service, including voice telephone service. This authority has not been exercised as of yet, and no intervention on the part of the Administration is expected in this area as long as prices are not higher than in comparable countries.

3.6.2 Leased Lines

The supply of leased lines is addressed specifically in Article 33 of the Telecommunications Act. In the absence of effective competition in the market the Post and Telecom Administration must ensure that at least one operator with a significant market share offers leased lines in retail or wholesale of the types which the Administration believes are needed in the telecommunications market.

An obligation concerning the supply of leased lines was imposed on Iceland Telecom during the effective term of previous legislation. This means, among other things, that Iceland Telecom must observe non-discrimination and take care not to offer different terms in similar business, particularly in comparison with the terms enjoyed by its own departments. In other

words, the company is required to supply leased lines to other parties on the same terms and of the same quality as to its own departments and subsidiaries.

Charges for leased lines should be based on the principle of cost-orientation and transparency. The cost of leased lines mainly involves the direct incurred cost of operators resulting from the installation, operation and maintenance of leased lines as well as marketing and invoicing. To the extent possible, common costs shall be divided on the basis of an analysis of their origin.

Pursuant to the above, leased lines are based on cost. A new tariff for leased lines took effect on 1 October 2001 following consultation with the Post and Telecom Administration. Significant changes were made in leased line charges; the charges for main lines increased by up to 60%, while the charges for user lines increased, in some cases by up to 90%. On the whole, a significant reduction was involved, which has resulted in increased demand for leased lines. In this context it should be noted that the direct installation, operation and maintenance cost to Iceland Telecom increases in proportion to the length of the line. For this reason there are limits to the extent to which the company can go in offering leased lines at the same price, regardless of length. However, increased traffic and improved efficiency in the use of the fixed line network brings in increased income against costs, which justifies a general reduction in unit price. The current leased line tariff came into effect on 1 March 2005.

User lines (loops) extend from telephone exchanges to users within the same exchange area. Usually, these are copper lines with a transmission capacity of up to 2 mb/s based on existing technology, but the transmission capacity is reduced as the user lines become longer. Technically, the user line is divided into two factors: terminal equipment and line. The terminal equipment may be owned by Iceland Telecom or the customer. Iceland Telecom offers user lines in several categories based on transmission capacity with the price increasing in line with transmission capacity. In the price determination it was assumed that all lines were of equal length and that in general the distances in the user line network would not exceed 2 kilometres.

Base lines extend between all telephone exchanges in the metropolitan area and between all exchanges elsewhere in the country. In addition, base lines extend to all distribution points for mobile telephones and most distribution points for radio and television. Most base lines are optical fibre, although sometimes microwave connections are used. Base lines are divided into terminal equipment and the transmission medium, optical fibre or microwave path. The current transmission capacity in the base line network is 2.5 Gb/s, but will soon be increased to 10 Gb/s. The obligation is imposed on Iceland telecom for lease tariffs to be based on cost, and the cost of laying optical fibre is demonstrably dependent upon length. The cost of the equipment is partly fixed, but partly dependent on distance, since transmissions need to be amplified at regular intervals. The tariff is based on two main factors: a fixed charge (ISK/month), calculated based on the cost of equipment, and a distance charge (ISK/km/month) which is mostly the cost of laying and operating the optical fibre.

3.6.2.1 Interconnection

The Telecommunications Act No. 107/1999 provided for the obligation of enterprises in positions comparable to that of Iceland Telecom hf. to provide access to its

telecommunications networks and services at cost price plus a reasonable margin. Article 26 of the Act laid down the basic criterion concerning the remuneration an enterprise with a significant market share, like Iceland Telecom, should receive for its service. The provision states that charges for interconnection should be transparent and based on the cost of establishing and operating the network, in addition to reasonable return on capital on the basis of mandatory cost accounting. The burden of proof that charges are calculated from actual costs shall lie with the organisation providing access to its facilities.

The Post and Telecom Administration may request the organisation in question to provide full reasoning for its interconnection charges and, where appropriate, shall require adjustment of charges. This provision shall also apply to mobile telephone organisations which have been identified by the Post and Telecom Administration as having significant market power on the interconnection market.

As this provision indicates, Iceland Telecom must maintain comprehensive cost accounts, as the company is required to prove that interconnection charges are determined on the basis of cost. For this purpose, the Post and Telecom Administration may require reasoning for cost figures and adjustments in the charges when necessary.

3.7 Regulation on Separation of Costs

Paragraph 5 of Article 32 of the Telecommunications Act No. 81/2003 authorises the Minister for Communications to issue a government regulation on the separation of costs in the operation of telecommunications enterprises. A similar authorisation was contained in Act No. 107/1999, and on the basis of this authorisation Government Regulation No. 960/2001 was issued on the separation of costs in the operation of telecommunications enterprises. A draft for the regulation was prepared by the Post and Telecom Administration at the request of the Ministry. The Administration was advised by the accounting firm Deloitte & Touche and called for comments from other telecommunications operators in the market.

The regulation defines the authorisation for government authorities, especially the Post and Telecom Administration, to require the separation in the accounts of telecommunications operators of costs arising in networks and service activities. In certain cases it is understood that financial segregation may be required. This applies particularly if enterprises engaging in protected activities also engage in telecommunications activities. It is also possible for the Competition Authority to require financial segregation on the basis of competition law.

The purpose of the cost separation is to make it possible to calculate the various service factors of telecommunications enterprises. Such calculations are necessary in relation to services which, pursuant to Icelandic law and Community directives, must be rendered on terms which are directly linked to their cost. Examples of such services include interconnection, leased lines and leasing of local loops, and, in some cases, universal service. In general, obligations in this respect are limited to companies with a significant market share.

Corresponding rules are in preparation in most of the countries in the European Economic Area. The United Kingdom has been at the forefront in the preparation of cost-accounting rules and had already developed methods for separation in 1997. The European Commission has recommended a certain methodology in connection with the interconnection of networks and in the review of the Community legislation on telecommunications currently in progress

it is assumed that the same methods will be used in the cost analysis of network access. Local loop lease can also be classified under interconnection.

A working group formed by the association of surveillance authorities in the European Economic Area has recently returned proposals concerning a joint effort of surveillance authorities to work out the details of directives in this area. The Post and Telecom Administration has participated in the work of the working group to the extent possible.

There are various methods available as regards the cost separation of telecommunications enterprises. One method worth noting is referred to as Long Run Incremental Costing - LRIC. Examination of this method has been emphasised for the reason, among other things, that in virtually all the member states of the European Economic Area there is one dominant enterprise at the start of the liberalised telecommunications market, the incumbent company. Long Run Incremental Costing aims to find the cost of providing a service in addition to existing services or possibly a new service factor. The long-term factor is based on the assumption that all cost should be variable, or, in other words, the costing should take account of long-term investment and costs. Within this framework different options can be chosen in the analysis and creation of a model. This raises issues such as whether to calculate costs based on the current network arrangement (i.e. scorched node) or from the ground based on an optimisation model (scorched earth) and whether the most recent costs of the telecommunications enterprise should be used (top-down) or new minimum cost figures obtained (bottom up). This is compounded by issues such as assessment methods for assets, amortisation and calculation of cost of capital.

3.7.1 Interconnection Charges

Requirements for interconnection charges were based on the EU Interconnection Directive 97/33/EC, which has been incorporated into the EEA Agreement and is therefore binding for Iceland. Annex V to the directive contains further details of the cost accounting system. The EU Commission has also issued a Recommendation with further details concerning the provisions of the directive (see 8/195/EC and 98/511/EC, which have also been incorporated into the EEA Agreement). It is assumed that long run average incremental cost (LRAIC) will be used rather than historic cost in determining the price of services. This is clearly revealed in the preamble to the directive and the cited recommendations of the Commission.

Sub-paragraph 2 of Paragraph 1 of Article 26 of Act No. 107/1999 laid down the requirement that telecommunications operators with a significant market share should post a reference offer. More precisely, it is stipulated that the Post and Telecom Administration can require an enterprise with a significant market share to publish such an offer. The content of such a reference offer is not exhaustively described in the Article, but it is stated that the offer must contain an itemised description which is consistent with stakeholder needs. The Interconnection Directive imposes on regulatory authorities in individual states the obligation to ensure that enterprises with a significant market share publish their reference offers for interconnection.

The obligations of telecommunications enterprises to publish a reference offer and guidelines on the content of such offers are included both in the Interconnection Directive, Section 7.3, and in the Directive on competition in the markets for telecommunications services, 90/388/EC, as amended. The European Commission has issued guidelines on the contents of

reference offers. The offer is intended to make it easier for new enterprises in the market to assess the possibilities afforded to them by interconnection of offering new telecommunications options to customers. In Iceland, rules on reference offers for interconnection were established in January 2002 (No. 94/2002). This was followed by work on the preparation of Iceland Telecom's reference offer, which was published in December 2002.

The European Union issued a recommendation concerning interconnection charges during the term of effect of previous directives. The guidelines established by the European Union with its recommendation will be used as a reference until a further decision is made based on the current Telecommunications Act. It is a requirement that reference offers must be transparent and based on costs, but the burden of proof regarding the cost rests with the telecommunications enterprise which has a significant market share. It has been suggested by the European Union that long run average incremental cost (LRAIC) should be employed, as this cost model is best suited to a competitive market. Post and telecom administrations in the European Economic Area are required to recognise only prices falling within the framework of best current practice within the EU states unless telecommunications operators can definitively prove more cost. This obligation rests on the regulatory authorities until LRAIC-based tariffs have been established. Different cost bases must not be used depending on whether a telephone call begins in the fixed network or mobile network, and no discrimination is permitted against telecommunications operators based on their location in the European Economic Area.

3.7.2 Obligations Following Market analysis

According to Temporary Provision II in the Telecommunications Act No. 81/2003, all obligations concerning access and interconnection which are currently applicable to electronic communications undertakings offering public electronic communications networks or services, shall continue in place until a review of the obligations has been concluded following market analysis. The market analysis shall be conducted in compliance with Chapter V of the Act, which reveals, among other things, that the 25% market share is no longer used as a reference in imposing obligations on enterprises; instead, the methods of competition law are employed in assessing market position. The Post and Telecom Administration has already started work on preparing a market analysis, which is scheduled for completion in 2006. The conduct of the market analysis can be divided into three stages.

- 1) Defining the relevant service markets and geographical markets.
- 2) Analysing each of the markets, assessing whether competition in the markets is effective and deciding whether there are one or more enterprises with a significant market share.
- 3) Deciding whether to impose, maintain, change or withdraw obligations on enterprises with significant market shares.

When market analysis shows that there is no effective competition in a certain market and that a telecommunications enterprise in the market, one or more, has a significant market share, the Post and Telecom Administration can impose obligations on the enterprises to secure reasonable competition opportunities for competitors.

Obligations are intended variously to address the conduct of an enterprise working against competition, in which case it is described what conduct the enterprise should or should not engage in, or to influence the market position (especially barriers to entry) in order to promote effective competition and to preclude abuse of market dominant position.

The obligations imposed on enterprises must be justifiable and must not be excessive in light of the objectives they are intended to achieve. They should be tailored to solve certain competition problems which have come to light in the course of market analysis. Before any obligations are imposed on an enterprise it should be ascertained to the extent possible what their impact will be on the market.

If an enterprise is designated as an enterprise with a significant market share, one or more obligations should be imposed on it, as necessary to achieve a set objective. If the Post and Telecom Administration has previously imposed obligations on the enterprise on the basis of earlier legislation the option is either to maintain such obligations or to change or withdraw them in accordance with the conclusions of the market analysis.

European directives contain a list of obligations which may be imposed on enterprises which have been identified as holding a significant market share. In addition, the Post and Telecom Administration may impose other obligations than those listed in the directives subject to the approval of EFTA Surveillance Agency. Obligations imposed on telecommunications enterprises are discussed in Articles 27-32 of the Telecommunications Act No. 81/2003.

3.8 Obligations which May be Imposed on Enterprises in the Wholesale Markets

The principle of proportionality applies in all cases where the Post and Telecom Administration is assessing the need for imposing obligations on telecommunications enterprises, i.e. obligations imposed must not be more onerous than necessary to achieve the intended objective.

3.8.1 Access to Telecommunications Networks

Access to telecommunications networks and services is of key importance for emerging telecommunications enterprises in the market, as in many cases it is impossible for new enterprises to set up facilities which are comparable to those set up over a long period of time by an enterprise enjoying a significant market share. It is therefore necessary that there should be a means of imposing obligations on that enterprise to accede to normal and reasonable requests for access and use of telecommunications networks and related facilities.

The matters falling within the scope of such obligations pursuant to Article 28 are not exhaustively enumerated, but they include, e.g., unbundled access to local loops, co-location or joint utilisation of equipment, and offering specified services on a wholesale basis for resale.

3.8.2 Transparency

Terms relating to interconnection and/or access to networks and services are of great significance to virtually all emerging telecommunications enterprises as the terms can have a decisive impact on their potential for gaining a foothold in the market. It is therefore important for them to know what terms are on offer as regards access and services which they need to purchase from other enterprises and the basis of the pricing and other terms.

The Post and Telecom Administration can impose on enterprises the obligation to disclose certain information, such as account information, specifications, information on network characteristics, terms and conditions of delivery and use and price information. Exemptions can be granted from the disclosure of information if an enterprise can demonstrate that it concerns important financial or business interests which should normally and reasonably be maintained in confidence.

When an enterprise is placed under obligation to observe non-discriminatory practices the Post and Telecom Administration can instruct the enterprise to issue a reference offer containing an itemised description of interconnection or access together with terms and conditions, including tariffs.

3.8.3 Non-discrimination

In general, non-discrimination means that an operator applies equivalent conditions in equivalent circumstances to other undertakings providing telecommunications services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners.

3.8.4 Accounting Separation

The Post and Telecom Administration may impose obligations for accounting separation between activities related to interconnection and/or access and other activities so that all revenues and costs can be allocated to operating units which can be linked with different services. This obligation is particularly intended to support the obligation of transparency and non-discrimination, and the Post and Telecom Administration may require an enterprise operating both a telecommunications network and telecommunications service to make transparent its wholesale prices and its internal transfer prices, *inter alia* to prevent unfair cross-subsidy. The Post and Telecom Administration may specify the format and accounting methodology to be used in the accounting separation.

3.8.5 Price Control and Cost Accounting

When market analysis shows that a lack of effective competition is having the effect that an enterprise with a significant market share is charging excessive prices or that there is an unreasonably narrow margin between wholesale and retail price, the Post and Telecom Administration may impose various pricing obligations. A requirement may be imposed for tariffs to be based on cost and for cost accounting in respect of certain types of interconnection or access. The burden of proof that a tariff is in fact based on cost rests on the enterprise in question. A telecommunications enterprise may be required to prepare a cost model for the calculation of certain charges. The Post and Telecom Administration may, in the calculation of cost, take account of the cost of a similar service at a company which is regarded as efficiently operated, and it may also use accounting methods which are different from the methods of the telecommunications enterprise.

3.9 Obligations which May be Imposed on Enterprises in the Retail Markets

3.9.1 Control of Retail Services

It is generally understood that encumbrances and obligations should only be imposed on retail services when appropriate measures relating to wholesale or measures relating to carrier selection and carrier pre-selection have not proven effective in securing effective competition and the interests of the public.

3.9.2 Access to Leased Lines

The Post and Telecom Administration may impose on enterprises with a significant market share an obligation to offer equal access to leased lines at a cost-itemised price with transparent conditions and pursuant to specific quality standards.

3.9.3 Carrier Selection and Carrier Pre-selection

Enterprises which have been designated as enterprises with a significant market share in the field of interconnections with the public fixed network are obliged to enable their subscribers to have access to the services of all interconnected enterprises providing public voice telephone service. The arrangement of such access can be either that the user selects a prefix before each call or by carrier pre-selection which can be circumvented in individual telephone calls by selecting a prefix. Charges for access and interconnection relating to the supply of carrier selection and pre-carrier selection shall be based on cost plus a reasonable margin.

3.10 Third-generation Mobile Telephones

Extensive changes have occurred in world telecommunications in recent years, both as regards technology, services and legal environment. The developments in recent years have transformed traditional telecommunications; wireless communications are increasing in voice telephony, charges for international telephone calls are dropping and the convergence of telecommunications, media broadcasting and personal computers has having a revolutionary impact. In the future, telecommunications will increasingly be based on data transmissions, such as remote processing, distance education, distance medicine, Internet banks and interactive television. New methods are creating new possibilities in public telecommunications networks, such as xDSL, digital user lines and Internet Protocol.

A new public mobile telephone network (UMTS) is now emerging in the mobile telephone market. The transmission capacity for data in this system will exceed the potential capacity of current GSM systems. It is anticipated that the transmission capacity will be up to 2 mb/s, as compared to 128 kb/s, which is the maximum GPRS capacity, which can be increased by up to double using EDGE technology, in the GSM mobile service. This will enable telephone enterprises to offer much more extensive services than the services currently known, including entertainment, interactive services, teleprocessing, teleconferences, electronic trade, payment services and automatic information services. In addition, it is anticipated that terminal equipment will become simpler and offer more advanced software than current systems. For this reason it is anticipated that third-generation mobile telephones will play a key role in the operation of telecommunications enterprises in the future.

Terminal equipment for third-generation mobile telephones is emerging on the market much later than previously anticipated. The equipment is more advanced than current GSM equipment, and the emphasis is on large screens owing to increased data transmission. As in the case of GSM mobile telephones, the third-generation mobile telephones will be based on European standards, which means that the telephones will be used in all countries which develop a UMTS mobile telephone network, but in addition it is to be expected that mobile telephones will be manufactured which can be used in all IMT-2000 mobile telephone networks.

In Europe, third-generation systems will normally be set up in connection with second-generation systems. If a third-generation operator does not possess a second-generation system a roaming agreement is needed with a company operating in the area in which the third-generation operator intends to operate. Interaction of the third generation with the existing mobile telephone network is important, since moving traffic which does not require much bandwidth to the existing system will ease the load on the third-generation system and thereby increase its capacity for traffic requiring significant bandwidth. Third-generation systems will most commonly be set up in urban areas where substantial data transmission and simultaneous use is to be expected. Roaming agreements in areas not reached by UMTS are necessary so that the equipment can be used as a GSM telephone where other service is not offered. In this context, however, it should be noted that the International Telecommunication Union approved a new standard for high-quality voice telephony on 31 January 2002. The new standard, Recommendation G.772.2, will greatly increase the compatibility of telecommunications equipment, whether as regards the GSM, ISDN, voice telephone services in the fixed network or data transmission in the IP traffic control systems. The standard will bring all telecommunications closer to the technology on which the Internet is based. It is anticipated that the price for third-generation systems will fall rapidly in the coming years as soon as it goes into mass production for the market.

Already, 32 states have allocated 120 third-generation licenses. Japanese mobile telephone enterprises began operating such systems in mid-2001 and encountered some initial difficulties, but the number of users has grown substantially recently and are now more than 19 million. This increase can be attributed, among other things, to the falling cost of terminal equipment and a more diverse range of services.

In Europe, this development has been much slower, and the anticipated rapid development has not materialised. In most of the member states of the European Union there are now third-generation mobile telephone networks of varying coverage.

At international frequency conferences third generation mobile telephones have been allocated specific frequency ranges, totalling 155 MHz in the first stage. It may be anticipated that up to six licences can be issued, depending on the range allocated to each applicant. There has been much public discussion of how these frequency ranges should be allocated to telecommunications companies, as the arrangement of licensing can have a significant impact on their operation.

3.10.1 Allocation of Licences for Third-generation Mobile Telephones

Two principal methods have been used of allocating rights to operate third-generation mobile telephone networks, i.e. tenders and auctions. Both methods have advantages and disadvantages. The principal tender procedures, and the ones provided for in Act No. 65/1993

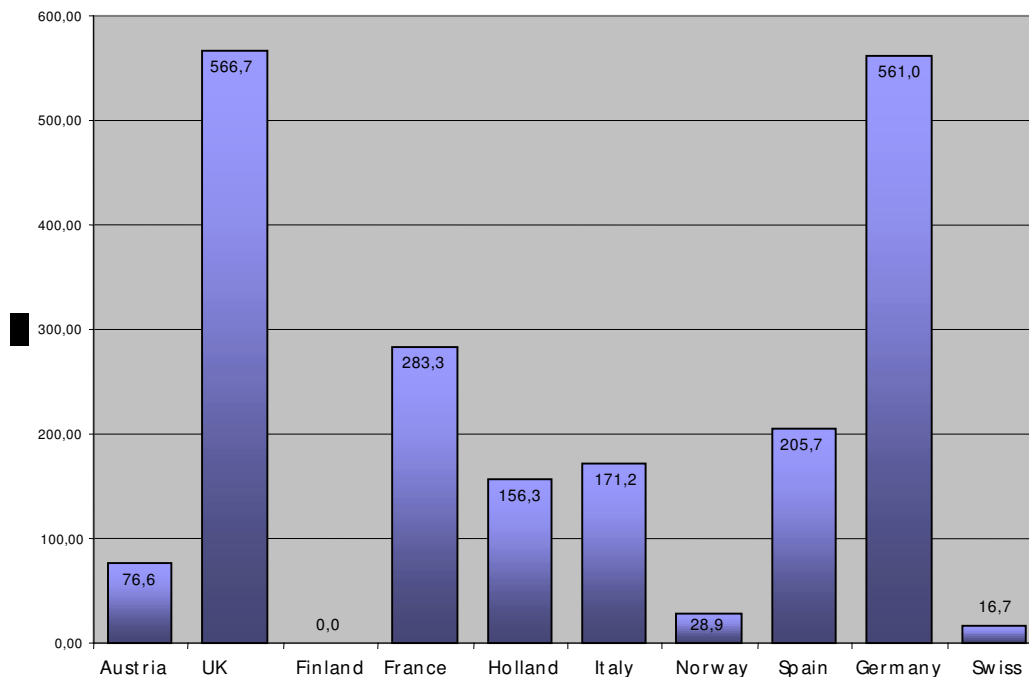
on tendering procedure, are on the one hand open procedures and on the other hand restricted procedures. The principal difference between these two tendering procedures lies primarily in the possibilities for participation.

Several states have chosen the approach of auctioning mobile telephone licences. The auction procedure is exclusively a price competition. Qualified bidders submit their bids simultaneously in several rounds.

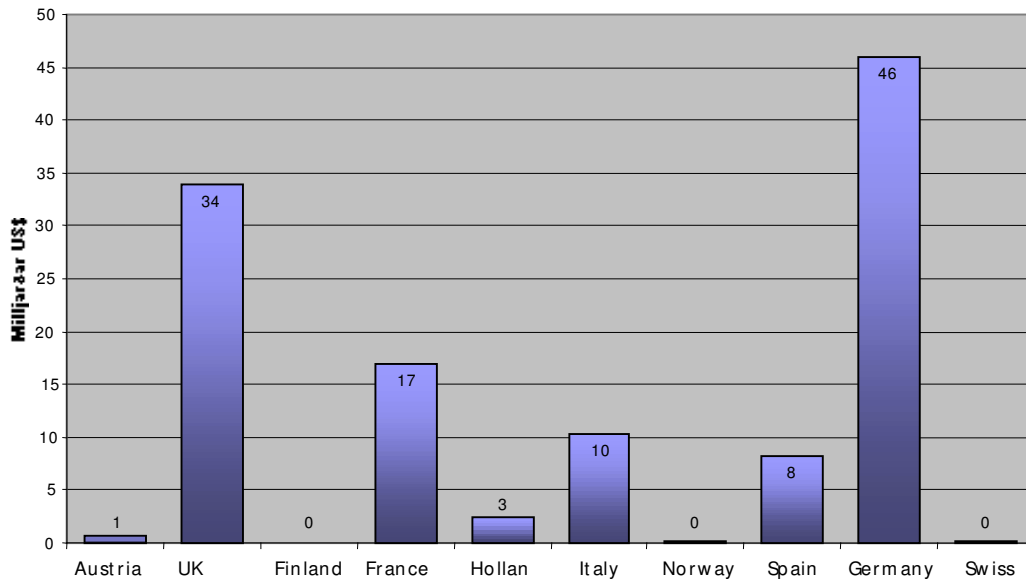
The countries that have used the auction approach include the United Kingdom, the Netherlands, Germany, Italy, Switzerland, Portugal, Denmark, Austria and Belgium. On the other hand, countries that have used the “beauty contest” style of tender include Finland, Spain, Norway, Sweden, Ireland, Luxembourg and France. In France, the decision was made to collect a substantial license fee without the amount being determined by tender; this was based on the substantial bids made for such licences in the United Kingdom and Germany.

State revenues from the issue of operating licences for third-generation mobile telephones have been substantial in countries where the auctioning approach has been used and/or where a large licensing fee has been imposed. In other countries, the fee has more frequently been based on the cost of administration and services rendered by the state.

Charge per person for third generation licences at the start of allocation



State revenues from licence fees for third generation mobile telephones



Chapter III of the current Telecommunications Act discusses permits for telecommunications activities. The provisions of this chapter are based on Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive). The new directive removes entirely the rule that telecommunications enterprises need to apply for authorisations. From now on simple registration is sufficient to be permitted to offer electronic communications services. Telecommunications enterprises must conduct their activities in compliance with the general conditions established by the Post and Telecom Administration. If telecommunications enterprises require frequencies or numbers for their activities they need to apply for such rights to the Post and Telecom Administration. The Post and Telecom Administration allocates frequencies and establishes certain conditions on an ad-hoc basis regarding their use. The permitted conditions are listed in Article 10 of the Act. According to the Authorisation Directive the number of frequency rights for each type of service or telecommunications network can only be limited to the extent necessary to ensure efficient use. In deciding limitations on the number of permitted undertakings the focus should be on the interests of users and promotion of effective competition. The frequency range intended for use by third-generation mobile telephones is limited and therefore it is permitted, and in fact necessary, to limit the number of operators.

On the basis of the provisions of the Telecommunications Act, the Post and Telecom Administration has organised tenders for the allocation of permits to operate TETRA, DCS 1800, GSM 900 telecommunications systems and microwave user systems (FWA). Calls for applications have been issued disclosing beforehand the issues which will determine the choice between bidders, such as proposed coverage, speed of development, quality, experience of telecommunications operations etc. As regards third generation mobile telephones, it is regarded as necessary to establish special rules governing the tender procedure. In order to ensure general access by Icelanders to this important service certain conditions regarding minimum coverage must be established, as well as terms that will

encourage enterprises to serve as large a part of the country as possible beyond the set minimum.

In previous authorisations it has been necessary to invoke provisions on the withdrawal and reallocation of frequency permits. When the third operator in the GSM 900 service was issued an operating licence in Iceland, the two existing operators were required to return part of the frequency which they were not regarded as having adequate use for. It is possible that in the later stages of development of the third generation mobile telephone networks it will again prove necessary to invoke these provisions. It is also likely that because of the physical qualities of wireless telecommunications at such high frequencies the structure of the network will need to be quite dense. For this reason it is probable that there will be increased need for co-operation among operators in the development of networks and increased need to invoke the rules of the Telecommunications Act concerning access to the networks and facilities of telecommunications enterprises.

The allocation of frequencies for the operation of third generation mobile networks will not only need to take account of the provisions of the Telecommunications Act, but also Iceland's obligations deriving from its membership of the European Economic Area. The most important source of law in this respect is the cited Authorisation Directive, no. 2002/20/EC.

Although the sources of law of the European Economic Area provide a certain framework regarding authorisations, arrangements within the EEA have varied somewhat from country to country. This applies particularly in cases where it has proven necessary to limit the number of permitted operators. Many states use a comparative approach to applications to decide the allocation of operating licences in limited frequency ranges, while others have chosen the auctioning procedure and allocated licences to the highest bidder. Both of these procedures will, in fact, fit within the framework. The general principles concerning objective, transparent allocation procedures designed to maximise the utilisation of frequency ranges do not formally distinguish between approaches so long as the cited objectives are attained.

The general principle of the Authorisation Directive, No. 2002/20/EC, concerning fees collected from telecommunications enterprises is that the fees should only cover the necessary administrative costs relating to the general authorisations and special rights of telecommunications enterprises. An exception is permitted in the case of limited resources, in which case it is permitted to collect a special fee for the use of frequencies. Fees shall be non-discriminatory and take account of viewpoints relating to competition and development of services.

On 7 February 2005 the Althing passed an act of law relating to third generation mobile telephones. The Act assumes the allocation of up to four permits in the frequency range of 1900 – -2170 MHz following an open tender procedure organised by the Post and Telecom Administration. According to the Act, a minimum coverage of 60% is required in four designated areas of the country in compliance with further provisions on stages and development levels which will be specified in the course of the tender procedure.

Each allocation of frequencies will be subject to the payment of a frequency fee of ISK 190 million in four equal payments within two years from the allocation. For the development of a telecommunications network in excess of the minimum requirement a discount will be

granted on the frequency fee amounting to ISK 10 million for each percentage of the population in excess of 60% outside the metropolitan area of the capital. However, the frequency fee will never fall below ISK 40 million. In addition to the frequency fee, each permit holder will pay an allocation fee of ISK 4 million to the Post and Telecom Administration in addition to the cost of the preparation of materials for the tender procedure.

The third generation mobile telephones will create a new service market using new technology and new methods of business communications which may be expected to have a generally positive impact on the economy. It is also to be anticipated that the rights to the operation of third generation mobile telephones and the expansion of the network will also bring about increased competition on the mobile telephone market.

3.11 Agreement with the United States on the Development of a Fibre Optic Network

An agreement is in force between the governments of Iceland and the United States, acting for NATO, concerning the development, operation and maintenance of a fibre-optic network in Iceland for use the air defence system of the United States Armed Forces. The agreement was executed in July 1989. The agreement provides that three out of eight fibres in the fibre optic network will be owned by the Icelandic government for use by NATO for the radar stations in Iceland. On behalf of the State of Iceland, Iceland Telecom has been responsible for the operation and maintenance of the three fibres and attended to the contractual obligation applicable to them. A separate service agreement concerning the operation and maintenance of the system is still in effect and is subjected to review every year, where Iceland Telecom submits a cost estimate for the ensuing year which needs to be approved by the United States. The Icelandic National Audit Office is responsible for the required financial accounting.

In the laying of the fibre optic cable and its connection with telephone exchanges the three fibres have been kept completely separate from other parts of the cable (the other five fibres), and there has been no use of the three fibres for the benefit of Iceland Telecom. The three fibres and terminal equipment in the radar stations to which the fibre optic cable is connected was paid in full out of NATO funds, and by agreement they are owned by the State of Iceland but in the care of Iceland Telecom.

On the sale of shares in Iceland Telecom it will need to be ensured that the obligations undertaken by the State of Iceland in the agreements made with the United States on behalf of NATO will be met. The method of achieving this objective will be that the State of Iceland will retain as its property the three fibres designated as the property of the Icelandic State in the agreements. The United States, on behalf of NATO, will have unrestricted access to and use of these three fibres. These measures do not, in fact, represent any change in the existing arrangements. They do not affect the service capacity of Iceland Telecom either, as the data transmission capacity of the fibre optic cable will not be limited in the foreseeable future. The other five fibres, however, will be owed by Iceland Telecom like other facilities of the company.

3.12 Competition

In the preparations for the sale of the State interest in Iceland Telecom hf. specific attention has been given to competition in the telecommunications market. A recent OECD report on privatisation, competition and regulation reveals that in countries where market competition was ensured concurrently with privatisation, service quality has improved and prices have gone down.

Efficient regulation has great significance for the development of the telecommunications market. Government regulation is important to ensure consumer security in fields where oligopoly exists, but also to ensure effective competition in other areas of telecommunications. The enactment of the Telecommunications Act and the Act on the Post and Telecom Administration represented a major step in the direction of securing regulation of the telecommunications market, both through general provisions concerning telecommunications services and through provisions on the role of the Post and Telecom Administration.

The purpose of the new telecommunications legislation, as revealed earlier, was to secure competition in the telecommunications market and to create a situation where enterprises could start up operations in a normal competitive environment. Also, the competition authorities have used their powers in various ways vis-à-vis companies operating in the telecommunications market. Since the enactment of the Competition Act No. 8/1993, the government authorities have processed complaints from enterprises who believe that they are not competing on an even footing with competitors who are operating to some extent under the shelter of government protection. The annual report of the Icelandic competition authorities in 1995, for instance, stated that these issues would continue to be the point of focus. Accordingly, the Competition Authority has kept Iceland Telecom under strong restraint. Iceland Telecom has been told that business activities in the competitive market should be conducted in a separate unit within the company with independent accounting. Iceland Telecom has also been notified that business between such units and Iceland Telecom should be conducted at market prices.⁷ The Company has also been instructed to ensure, e.g. by the signature of declarations of confidentiality, that sensitive business information will not be conveyed from employees in the Company's telecommunications network to employees working on a day-to-day basis in the mobile telephone services. Iceland Telecom is also under obligation to send to the Competition Authority a declaration of a chartered accountant concerning financial statements for the Company's GSM mobile telephone service.⁸

The measures taken by the competition authorities as regards Iceland Telecom and other public enterprises have the purpose of dispelling any suspicion, preventing cross-subsidies, securing non-discrimination in the market and promoting effective competition.

3.13 Role and Organisation of Regulatory Bodies

There are two government authorities in Iceland which are concerned with surveillance on the telecommunications market: on the one hand the Post and Telecom Administration, which was set up primarily for that purpose, and on the other hand the Competition Authority, which is generally concerned with the supervision of consumer services. In order to ensure

⁷ Competition Council Decision No. 21/1998

⁸ Competition Council Decision No. 17/1999

favourable working conditions in the telecommunications market, competition needs to be introduced among the service providers and ensure the best possible freedom of choice for consumers. The privatisation of Iceland Telecom hf. is a major milestone in this endeavour. Without the privatisation of Iceland Telecom hf., the government authorities can hardly maintain a credible policy for the Icelandic telecommunications market and fully non-discriminatory administration and surveillance. The objective of the government is to place Iceland at the forefront of technologically advanced states as regards inexpensive quality telecommunications service. Parliament and government authorities are responsible for ensuring fair rules in telecommunications, rules which will contribute to increased welfare and prosperity.

The Telecommunications Act establishes general requirements for operators and service providers on the telecommunications market, e.g. to ensure compliance with applicable basic requirements, availability of required information and prevention of anti-competitive measures, such as discriminatory tariffs. What distinguishes this act from other legislation on commercial activities, however, is the extensive provisions requiring market-dominant companies to provide competitors with access to their networks and services, together with provisions securing freedom of choice for consumers, i.e. their right to change service providers at a minimum cost, and access to certain basic services. All of this calls for active administration and effective surveillance on the part of government authorities. The strength of regulatory bodies is a key to securing competition in this market.

3.13.1 Post and Telecom Administration

The importance of the Post and Telecom Administration for the telecommunications market is undeniable, as the Administration possesses not only specialised knowledge of the technical aspects of telecommunications technology, but also is also granted powers pursuant to the provisions on network access which are more extensive than traditional competition regulations. Icelandic telecommunications legislation is modelled virtually exclusively on European legislation.

At the end of the eighties, the policy of the European Union was based on Article 90 of the Treaty of Rome (now Article 86), which is one of the basic competition provisions of the Treaty and incorporated into the Agreement on the European Economic Area. With new directives based on the internal market provisions of the Treaty of Rome, the legal foundation has changed. Of course, these directives are all consistent with the general competition provisions. However, the special telecommunications provisions have in some respects been taken beyond the general provisions. Thus, a recommendation, and more recently a regulation, has been adopted on access to local loops, which is largely based on the principles of competition law, but confers on the telecommunications authorities of EEA states more clearly defined powers than the powers attributed to competition authorities. Telecommunications legislation also contains much clearer provisions on entitlement to access to the essential facilities of incumbent telecommunications organisations than those which have been derived from Article 82 of the Treaty of Rome, Article 54 of the Agreement on the EEA, or Article 11 of the Competition Act No. 8/1993, as amended by Act No. 107/2000.

The Althing passed new legislation on the Post and Telecom Administration at its 130th session, Act No. 69/2003. According to the legislation, the Administration is responsible for postal and telecommunications affairs in Iceland with the following principal tasks:

- 1) Implementing the Telecommunications Act and the Postal Service Act and supervising electronic communications and postal services, as provided for in detail in the respective Acts. The Administration will enforce the Acts and support the achievement of their objectives;
- 2) Encouraging competition in postal and electronic communications services and preventing unfair business practices, for instance, by:
 - a) working to prevent distortion or limitation of competition on electronic communications and postal service markets,
 - b) encouraging efficient investment in electronic communications infrastructure and promoting innovation,
 - c) supporting the efficient use of frequencies and numbers and maintaining effective management of the use of these resources.
- 3) Participating in developing the market for electronic communications and postal service and information technology (IT), for instance, by:
 - a) working to remove obstacles to the provision of electronic communications networks, facilities and services connected with them, and electronic communications and postal services,
 - b) encouraging the establishment and development of electronic communications networks and interoperability of services encompassing all EEA states,
 - c) contributing to ensuring non-discriminatory treatment of electronic communications undertakings and postal operators in similar circumstances,
 - d) co-operating with other EEA regulatory authorities and the EFTA Surveillance Authority in order to establish harmonised surveillance practices and harmonised interpretation of legislation,
 - e) contributing to the convergence of electronic communications and information technology,
 - f) contributing to the development of the IT society through the focused introduction of new technology and working practices.
- 4) Safeguarding the public interest, for instance by:
 - a) working to ensure that all Icelanders have access to universal service,
 - b) contributing to the protection of consumers in their dealings with electronic communications undertakings and postal operators,
 - c) working on measures to protect personal data and privacy,
 - d) contributing to the publication of clear and comprehensible information for users and demanding transparent prices and conditions for the use of general electronic communications and postal services,
 - e) protecting the interests of users, including individual social groups, such as the disabled, to the greatest extent possible with regard to selection, price and quality,
 - f) ensuring that the integrity and security of public communications networks are maintained,
- 5) To advise the government and ministry in the field of post and telecommunications, and to monitor Iceland's compliance at all times with undertakings stipulated in international agreements in the field of post and telecommunications. The

- Administration shall, when necessary, address their recommendations regarding amendment to legislative acts and regulations to the Minister of Communications.
- 6) To participate in co-operation resulting from international undertakings in the field of post and telecommunications.
 - 7) Other tasks pertaining to the implementation of postal and telecommunications affairs.

These tasks involve, on the one hand, surveillance, and, on the other hand, various administrative responsibilities, such as the issue of permits and negotiation of contracts for the government ministries on various projects. The Post and Telecom Administration currently has 20 employees, in addition to the Executive Director, who is appointed by the Minister for Communications. Systematic efforts are in progress to strengthen the surveillance aspect of the Administration and its resources for protecting the interests of consumers and service providers.

The special provisions of telecommunications legislation, which have the purpose of promoting competition on the market, together with the expertise required for interpretation of the rules, have the effect that the principal responsibility for the establishment of a new order in the telecommunications market rests with the Post and Telecom Administration. The Post and Telecom Administration published in 2003 its policy for the period ending 2006. According to the policy, the principal role of the Administration is to ensure efficient, secure and accessible telecommunications services and to promote effective competition. The principal objectives of the Administration are the following:

- 1) To implement government telecommunications policy, e.g. as regards inexpensive telecommunications services, secure telecommunications, digital television, telecommunications channels to and from the country, third generation mobile telephones and universal service.
- 2) To work toward the continued development of the information society, e.g. by focusing on network security, broadband development and the convergence of telecommunications and information technology.
- 3) To inform consumers.
- 4) To promote effective competition, e.g. by market analysis, cost analysis and the publication of statistical information on prices and use.
- 5) To promote clear and transparent rules of the game.
- 6) To improve the efficiency of the Administration.

In general, the number of queries from enterprises and individuals to the sister administrations of the Post and Telecom Administration within the Single Market is growing rapidly. It is also clear that the Post and Telecom Administration will need to adapt to the convergence of television and telecommunications which is currently in progress.

The revenues of the Post and Telecom Administration are derived from the collection of charges for the issue of operating licences and other permits, an annual 0.2% charge on the turnover of telecommunications companies and charges on the allocation of telephone numbers. In addition, various other charges may be collected pursuant to the Post and Telecom Administration Tariff No. 313/2002 for the operation of technical equipment and use of frequencies.

Numerous tasks of the Post and Telecom Administration are time-consuming and require special efforts at the start when matters are being placed in their proper channels for the future. However, the work of the Administration, together with initiatives of stakeholders and public reception, are already beginning to produce results.

3.13.2 The Competition Authority

The Competition Authority has the task of securing quality goods and services for consumers at reasonable prices. This shall be achieved by promoting active business competition while at the same time ensuring observance of fair trade practices. Act No. 8/1993, as amended by acts no. 24/1994, 83/1997, 67/1998, 82/1998 and 107/2000, provides for the role of the Competition Council and the Competition Authority. The role of the Authority includes the following:

- To enforce the prohibition rules of the Competition Act;
- To decide on measures to be taken against anticompetitive behaviour of undertakings and against unfair trade practices;
- To observe that measures taken by public authorities do not restrict competition, and to indicate to the authorities any means by which competition can be made more effective and the entry of new competitors into the market facilitated;
- To provide for enhanced market transparency;
- To monitor credit card service activities;
- To inform the government if legal provisions are regarded as contradicting competition legislation.

The Competition Authority is responsible for surveillance of telecommunications enterprises as well as other enterprises, with the objective of ensuring their compliance with the provisions of competition law. Among the more important tasks of the Authority is to monitor adherence to the requirements for accounting separation in companies providing comprehensive telecommunications and possessing market dominance in any areas. The powers of the Authority are of a general nature. The Competition Authority currently has 22 employees, in addition to the Executive Director, who is appointed by the Minister for Industry and Trade.

3.13.3 Structure and Increased Co-operation

The Post and Telecom Administration shall enforce legislation on telecommunications and postal service and ensure that the objectives of such legislation are attained, e.g. by encouraging competition and preventing unfair business practices in postal and telecommunications services and the operation of telecommunications networks. The Administration shall accept for due process any disputes arising in relation to the operations of telecommunications companies, postal service operators, and holders of operating licences.

The Post and Telecom Administration is responsible for monitoring compliance by enterprises with legal provisions on increased competition in the telecommunication market and on lawful business practices. As issues arising in respect of telecommunications have been submitted variously to the competition authorities or the Post and Telecom Administration, and as it was often unclear which organisation was responsible for individual issues, legislation was amended so that the Post and Telecom Administration now only

handles issues which are the subject of legislation on telecommunications or postal affairs. Legislation on the Post and Telecom Administration provides that the Administration and the Competition and Fair Trade Authority shall jointly issue guidelines regarding the process and resolution of disputes that may fall within the scope of legislation on postal and telecommunications affairs and on competition. The establishment and publication of such rules is intended to prevent potential uncertainty regarding the limits of powers and jurisdiction of these authorities. The guidelines of the Post and Telecom Administration and the Competition Authority concerning process and decisions in telecommunications and postal affairs No. 265/2001 were issued in February 2001.

The competition authorities are responsible for surveillance of companies operating in the postal and telecommunications markets on the basis of the Competition Act. Thus, the legislation on telecommunications and on the Post and Telecom Administration do not alter the scope of the Competition Act or limit the powers of competition authorities in the postal and telecommunications markets. Notwithstanding legislation on telecommunications and the Post and Telecom Administration, the Competition Authority can exercise the provisions of competition law prohibiting collusion, misuse of market dominance, mergers and unfair business practices. This ensures consistency of competition rules in all sectors of business and comparable operating environments for all enterprises in this respect. Through Act No. 107/2000, the role of the competition authorities was substantially strengthened, e.g. by new provisions prohibiting the abuse of market dominance and a far-reaching prohibition on anti-competitive collaboration and collusion by business enterprises.

The rules of the game in telecommunications are in many ways different from the rules of the game in other sectors owing to the fact that telecommunications in Europe were only recently liberalised with the abolition of state monopolies. For this reason and others, the time has not been seen as being right for the transfer of certain legislative provisions concerning telecommunications services into the competition legislation, such as provisions on interconnection, network access and universal service.

4. Technological aspects of the basic grid – Premises and viewpoints

This chapter is a report by the IT and telecommunications consultancy firm Admon ehf. prepared last February and March for the Icelandic Executive Committee on Privatisation. The report is intended as input to the revised Report on the Privatisation and Sale of State Shares in Iceland Telecom.

The present report is divided into three main sections. The first section, *Technical definition*, deals with the units forming the Icelandic telecommunications network and describes their technology in general terms. The interaction between these units and the layering of telecommunication systems as well as traffic control via such networks are discussed.

The section *Aspects of systems segregation* outlines different perspectives on telecommunication systems and their possible segregation. It also discusses vertical and horizontal aspects, the value chain and layering of e- communications services.

The section *Assessment of segregation* outlines different definitions of the Basic Grid or basic-grid services, and discusses possible separation or segregation of Iceland Telecom. It presents arguments for and against separating the Basic Grid or basic-grid services from Iceland Telecom, and examines the possible consequences of dividing up the company.

This report emphasises topics extending outside Iceland Telecom's telecommunications network and services. An attempt is made to provide an overview of Iceland's telecommunications environment, and references are made to examples from overseas. The basic-grid infrastructures and services of operators other than Iceland Telecom are dealt with, among other things for the report to form an integral discussion document on the technical definition of the Basic Grid or basic-grid services as well as the state of affairs of telecommunications in Iceland from the perspective of possibilities in separating such services from other telecommunications business.

4.1 Technical definition

Telecommunication systems consist of many units, each of which has a specific function. Together these units form one integral system used to provide telecommunications services. Whenever a particular telecommunications service is used by a customer of an operator, a part of this set of units is used. A comparison can be made with tourism services, which are based on vehicles, road systems, accommodation, restaurants, etc. A tourist trip is often based on a package of such units being put together by a travel agency to provide tourism services.

Certain units that have a similar function can be grouped together. For example, units that have a long useful life, or are partially or completely independent of the latest technology, can be grouped together. A building, for instance, is mostly independent of what telecommunication equipment is installed in it, but buildings and other facilities still form an integral part

of telecommunications services. The discussion below describes the key units of telecommunication systems and their functions.

4.2 Local loops

A line of some sort connects most homes and company premises to the telecommunications operator's systems, which is located in some sort of a central station. In Iceland, such lines are underground, while abroad they are often overhead cables fixed to poles. In addition, the systems in the central stations can be accessed by a wireless connection through transmitting

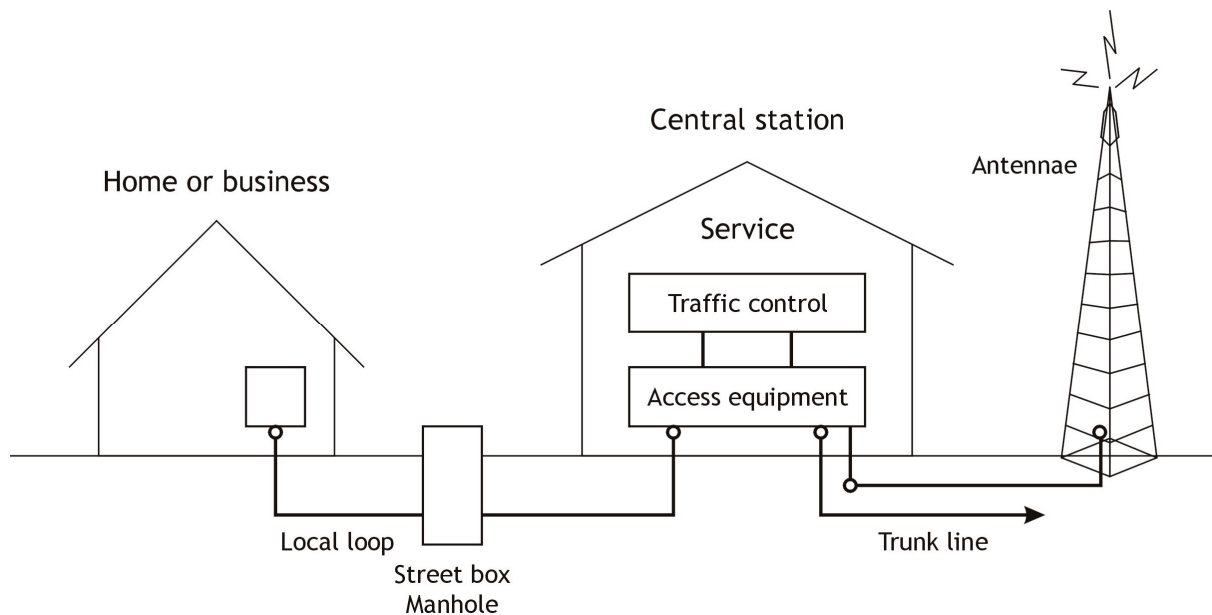


Figure 4-1 Connections of local loops

equipment. These channels are collectively referred to as local loops, meaning the medium or unit through which telecommunications signals are transmitted to and from the end user.

4.2.1 Telephone cables

Most homes and businesses are connected to a central station through conventional telephone cables (sometimes referred to as copper local loops). Typically, four wires extend into the subscriber's premises from the local telephone exchange, although the number of wires is sometimes higher or lower. Ordinarily, wires are installed in much greater numbers at corporate premises. Virtually all buildings in Iceland have such a connection, and telephone cables are installed in all new buildings. Thus, each user has sole access to a separate cable or wires. This is by far the most common way of connecting subscribers' premises to telecommunication systems today, and the same applies in Iceland. A telephone cable usually extends to a street box, which is a concentration station for lines from a number of buildings, and from the box larger cables extend to the local telephone exchange.

A telephone cable can be used to transmit many types of communications signals simultaneously; for example, voice telephony signals through one operator and xDSL⁹ signals through another. The data-carrying capacity of telephone cables is limited in comparison with other types of local loops. In Iceland, Iceland Telecom owns virtually all of these conventional phone cables.

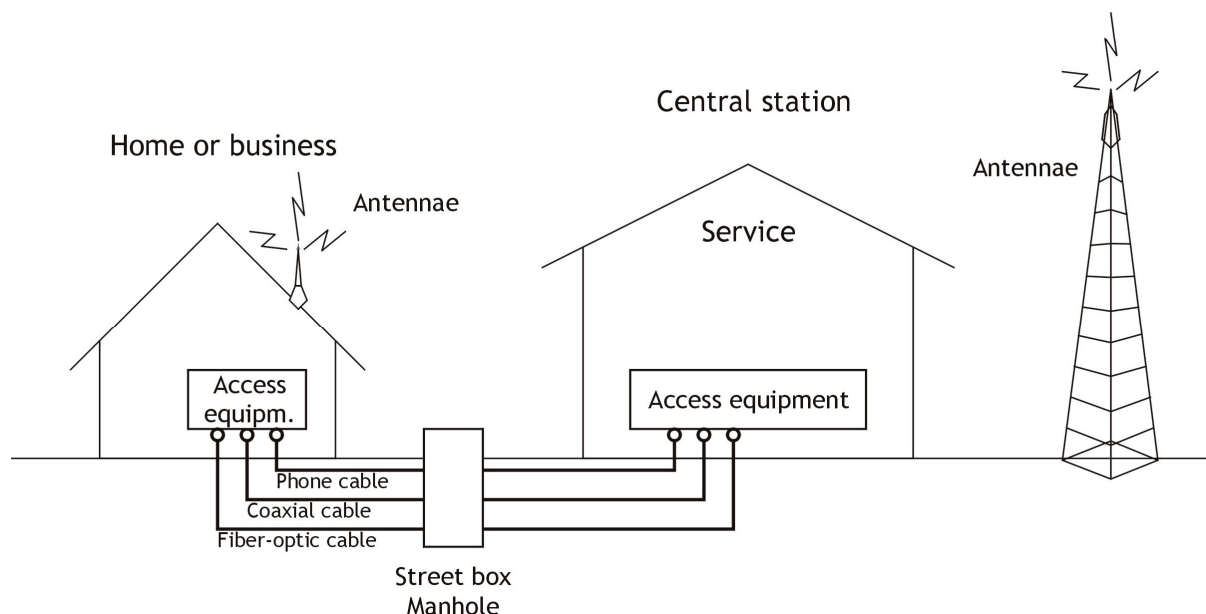


Figure 4-2 Different local loop media

4.2.2 Coaxial cables

In recent years, coaxial cables – such as those used to connect TV sets to antennas – have been installed in buildings in many parts of the world. In the past few years, this has also been done in Iceland in a number of places and municipalities by a number of separate parties. Iceland Telecom has been most instrumental in installing coaxial cables from street boxes to buildings, concurrently with other renovation. The primary purpose of such systems has been the transmission of TV broadcasts to which cable companies sell access to their customers, as coaxial cables have greater bandwidth than conventional phone cables. Cable companies are closer to being media enterprises than telecommunications companies in the traditional sense, as they often engage in broadcast programming. Iceland Telecom has used its coaxial cables to provide its customers with access to media. The cables can also be used to provide other services, such as Internet access, as has been done by Iceland Telecom. In other countries, cable companies offer Internet connections via their cable networks. Recently, a new technology for digital TV broadcasting has been brought into use, increasing quality and possibilities in controlling broadcasts, such as interactive features for users.

⁹ xDSL: (Digital Subscriber Line): A generic term for digital subscriber lines, where the "x" can be replaced with any of a number of letters, such as ADSL, HDSL and RADSL. An xDSL line enables simultaneous two-way transmission of voice and high-speed data over ordinary copper phone cables.

4.2.3 Optical fibre

In recent years, fibre-optic cables have been laid to many buildings and street boxes, usually parallel to phone cables or coaxial cables but sometimes separately. Such cables have been installed in a number of municipalities in Iceland. The advantage of fibre-optic cables over phone cables and coaxial cables is their superior bandwidth, which is practically limitless. The terminal equipment is the deciding factor for their data throughput each time. As the term indicates, optical fibre is a cable made up of thin strands of glass, along which light signals, instead of electric signals, can pass for communication. Like other local loops, a fibre-optic cable extends from a building or a street box to the nearest exchange, whose location and structure varies to some extent. Iceland Telecom has in recent times been engaged in targeted development of its fibre-optic network, to which many buildings and street boxes have been connected, including ones in the Greater Reykjavík Area, Stykkishólmur in west Iceland and Húsavík in north Iceland. However, other parties have also laid fibre-optic cables in the Reykjavík area, Akureyri and Sauðárkrúkur in north Iceland and elsewhere. Reykjavik Energy already owns an extensive fibre-optic network in the capital city area, and is working systematically on connecting all homes. The technology for carrying out installations and setting up connections has developed rapidly, and material costs have dropped substantially.

4.2.4 Wireless local loops

Wireless communications have been used for a long time to transmit signals, mostly in TV and radio broadcasting via antennae on mountain tops or by satellite. However, the past few years have seen a surge in the use of wireless communications, mostly driven by the proliferation of GSM¹⁰ mobile phones, but also various wireless computer connections. Such a transmission does not take place through a fixed, physical medium connecting the user to the service, but is flexible and independent of specific buildings. Therefore, it is simple to move the local loop anywhere. As in the case of optical fibres, the data-carrying capacity is huge, and the fact that there are no costs in relation to the installation of cables is a clear benefit. On the other hand, powerful equipment has been required for substantial data capacity. For short transmission distances, simple and inexpensive equipment can be used.

Nobody “owns” the wireless medium, but it is a limited resource. Therefore, a fee has been charged for its use in some cases. This is done when a given party obtains permission to use a part of it, such as a microwave connection between two buildings or a particular frequency. A part of the frequency spectrum is intended for public use without charge, provided that the equipment used fulfils certain criteria. Iceland Telecom has used this frequency range to create hot spots, where users of laptops with a network-interface card can connect wirelessly to the Internet. Hot spots are common at cafés, airports and accommodation establishments. Various other parties, such as the telecommunications company eMax, operate extensive wireless networks for connections to the Internet. Such solutions and services can be expected to grow substantially in the coming years.

¹⁰ GSM: Global System for Mobile Communication. Originally developed as a pan-European standard for digital mobile telephony, GSM has become the world's most widely used mobile system.

4.2.5 Power lines

Nearly all buildings are connected to electric lines, usually containing two or more wires. Similar to using phone cables, data as well as electricity can be transmitted through power lines. However, the key difference between using power and phone cables is that many subscribers' buildings use the same power lines. Therefore, it is more complicated to use power lines to provide separate services to each customer. In addition, power lines are structured in a manner that, as yet, limits data transmission, for example owing to disruption.

4.3 Trunks

The connection channels between central stations' switching systems, to which subscribers' premises are connected, are called trunk lines. They are designed for higher data-carrying capacity and more connections than local loops. Trunks can be short, for example between local telephone exchanges, or long when extending between regions, countries or continents. Trunks are usually fibre-optic cables, but were previously conventional phone cables or coaxial cables. They are sometimes radio connections, such as long-wave or microwave. Radio connections can be effective for establishing connections quickly, when the connection is only short-term and when, for any other reason, laying a cable in the ground is impractical.

Iceland Telecom owns most trunks in Iceland, including 4,500km of fibre-optic cables. The company has recently laid a substantial quantity of cables from switching systems to street boxes and to multi-occupied buildings, where coaxial cables take over to the users. In addition, fibre-optic cables are a type of trunk in that they transmit the communications of many unrelated users simultaneously. Other owners of trunks include Reykjavik Energy, which has cables in an integral network spreading over the capital city area, to Akranes and the Westman Islands. The telecommunications operator Fjarski also has an extensive trunk network linking different regions of the country. Norðurorka has, in partnership with others, installed sizeable quantities of trunks in the town of Akureyri in north Iceland. Farice hf., in which Iceland Telecom has a one-third stake, owns an approximately-1,400km-long submarine cable to the Faroe Islands and Scotland. The Icelandic State owns three pairs in Iceland Telecom's fibre-optic cable, which circles the whole of the country and extends to the West Fjords, totalling about 1,800km in length. The State-owned part of the cable is used by NATO (North Atlantic Treaty Organisation). Furthermore, a few private enterprises own trunk lines. Various parties own trunks overseas, such as phone companies, railway operators, energy companies and special trunk-line operators. However, the largest part of trunk lines is usually owned by conventional telecommunications operators.

4.4 Facilities

Local loops and trunk lines terminate at some facility. In addition, many cables are installed in pull-through tubes, enabling the addition and replacement of cables. Cables extend through manholes, conduits in buildings, etc. Together these units form the necessary facilities where various telecommunications equipment can be kept and connected to local loops and trunks. These assets represent substantial investment, and their construction and installation entail much dislocation. Normally, several telecommunications operators can share facilities, at least in part.

4.4.1 Installations networks

Most streets have street boxes at which cables terminate and various equipment can be stored. In many places, tubes extend from street boxes or manholes into buildings. The tubes are used, or are planned to be used, for laying cables when needed. Together tubes, manholes and connection boxes form installations networks for cables.

Iceland Telecom owns substantial installations networks, which have been revamped and improved considerably in the past few years and await to be brought into use. Other owners of such underground installations are primarily utilities. Reykjavik Energy has a large installations network in its operating area, and is making targeted efforts to expand it further.

Owning an installations network is an important aspect of the business of telecommunications operators, as such networks represent up to 75% of the total costs of trunk lines and local loops.

4.4.2 Housing

All around Iceland, there are buildings housing telecommunications equipment. Most municipalities have a central station building, often connected to the post office. There are also many smaller buildings in urban and rural areas, including on mountain tops. Such buildings often contain support systems, particularly for electricity feeders, such as batteries and auxiliary power generators. Iceland Telecom owns a large number of such buildings. Other parties owning buildings housing telecommunications equipment include the Icelandic National Broadcasting Service (RUV) and utilities. These buildings can vary in type and quality, ranging from simple huts to state-of-the-art systems centres with high operating security for sensitive equipment. These buildings are often shared by various operations, even ones unrelated to telecommunications. For example, Reykjavik Energy uses its transformer stations for active equipment in its fibre-optic network. The telecommunications operators also have contracts with the owners of tall buildings on facilities for transmission and associated active telecommunications equipment.

4.4.3 Masts

Masts are notable in many places around Iceland, and contain antennae for wireless transmission. Most of these masts are owned by Iceland Telecom, in addition to the RUV, the Civil Aviation Administration and other parties.

There is much telecommunications equipment underground and at central stations. Masts are the most noticeable telecommunications structures. Their location or conspicuousness often give rise to disputes. Some countries have passed laws under which owners of masts must allow any party that so wishes to use them, in order to restrict the number of masts for environmental reasons.

4.5 Connection equipment

Local loops and trunk lines connect to active telecommunications equipment with the appropriate interface for the type of transmission medium or cable in question, which enables the carrying of signals through such points. The type of circuit depends on the technology

used and the service provided, and changes accordingly. It receives data flows, which it shapes in order for the data to be carried through the cable, either separately or parallel to other data.

Examples of such equipment include conventional phones and mobile phones, ADSL

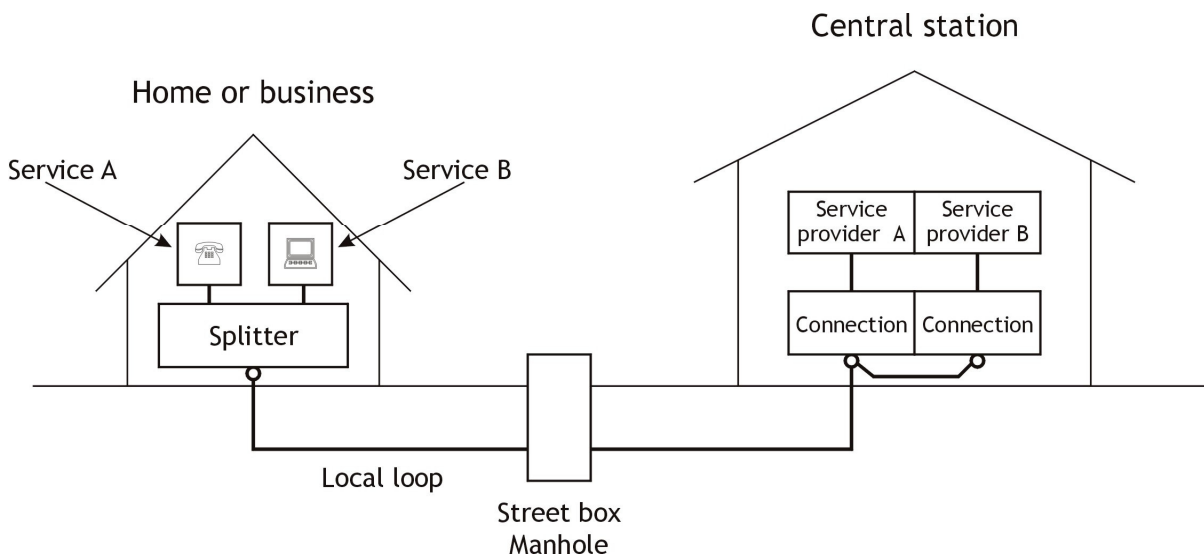


Figure 4-3 Shared use of local loops

equipment, modems, equipment for leased lines (including PDH and SDH¹¹) and fibre-optic terminal equipment, which converts electronic signals to light signals and vice versa. The same local loop, two wires, can thus be used to connect a phone and an ADSL circuit, which thus share the same line. This is done at present, with two service providers sharing lines, although only from or to central stations and not with equipment in street boxes. The next generation of DSL technology will enable increased speed to users, but this will require active equipment located nearer to users than is currently the case. An obvious solution is to locate such equipment in street boxes. Coaxial cables can also be used for the transmission of TV signals and Internet connections simultaneously. Icelandic operators have as yet not shared coaxial cables in local loops.

Multi-channel equipment is installed for trunk lines to carry many channels or various types of data simultaneously via one copper or fibre-optic cable over long or short distances between central stations. If the trunk line is a fibre-optic cable, then replacing the multi-channel circuit and thereby increasing transmission capacity is relatively simple and cost-effective. Iceland Telecom has thus increased the bandwidth of its fibre-optic network throughout the country.

In addition, bandwidth can be increased further by multiplying light signals in one fibre-optic cable and thus sending many light signals simultaneously through one and the same channel.

¹¹ SDH: Synchronous Digital Hierarchy, PDH: Plesiochronous Digital Hierarchy. A method used for multiplexing many circuits with a low bit rate onto fewer circuits with a higher bit rate, and vice-versa. PDH is the original multiplexing hierarchy used in 2 Mb/s and 34 Mb/s systems while SDH is the standard for transmission in synchronous optical networks above 34 Mb/s.

Thus, each light signal (a specific optical frequency) is, in effect, an independent transmission route that can carry many channels. Iceland Telecom has also done this.

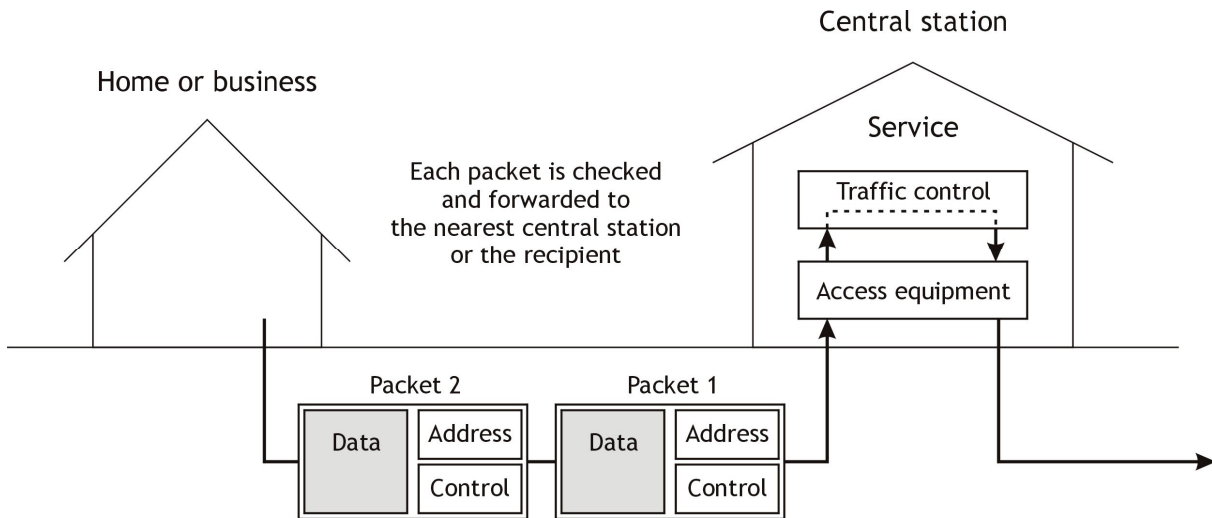


Figure 4-4 Control of data flow

Mobile telephony transmitters are, in the same way, shared connection equipment linking voice connections from GSM mobile phone stations wirelessly to the transmission medium. Such transmitters are connected via trunk lines or by microwave to central stations.

Various technology and methods exist for preparing and dividing the data for transmission between locations, prioritising them when appropriate, ensuring that they reach their destination without error, etc. Such routers can be part of the access circuit or other equipment somehow linked to the interconnection equipment.

Iceland Telecom owns a great deal of connection equipment of all shapes and sizes. Other owners of connection equipment include Og Vodafone (Og fjarskipti hf.'s brand for products and services) and Reykjavik Energy, and naturally end-users, i.e. the customers of telecommunications operators, own equipment of various types.

4.6 Control

As the users of telecoms networks are, naturally, spread over large areas and information could travel almost anywhere via any trunk, there are systems in place directing the data traffic to its correct destinations. In some cases, fixed channels or connections are installed, which are always present and reserved for the user. In other cases, channels are only set up when communication takes place. In yet other cases, no channels are set up, but instead blocks of data are sent as data packets, which include addressing information. The recipient's

address can be a phone number, an IP address¹², an e-mail address, a website address (URL), etc. Therefore, the central stations have some equipment or system that controls this data flow according to pre-set procedures. The systems can thus be telephone exchanges, Internet exchanges or e-post offices. These systems can be separate and independent from other systems or interconnected for them to work together on routing data. For example, the most common type of Internet connection used to be a dial-up connection for Internet traffic, which the voice telephony network delivered via fixed lines or voice telephony channels to the nearest telephone exchange and then on to an Internet switching centre. This has reversed, and now Internet connections are commonly used to transmit speech as well as non-speech data. Internet connections are even used to interconnect conventional telephone exchanges, or calls are handled by Internet switching centres. This is part of the trend towards better utilisation of telecommunication systems by using separate data packets, whatever the nature of the data, which are then carried between locations independently of other data packets on the same route. Thus, efficient use of telecommunications connections can be achieved by arranging blocks of different data on the same route.

There is currently much discussion about triple-play systems, which bundle voice, video and data and transmit them simultaneously, and whose market share is expected to jump in the next few years. Triple play distinguishes between the type of data packet in routing and prioritising, and controls the traffic based on different needs. Both Iceland Telecom's IP net and the ATM network are „triple play” since they can transport voice, video and data. The future telecommunications network of Reykjavik Energy, called the “fourth utility”, is based on the triple-play concept.

4.7 Layering

Outside or above the conventional telecoms infrastructures, there are various systems and equipment used to provide a range of services via the telecoms networks. This includes diverse services, including content provision, such as TV channels or web media, various other data and systems providers, call centres, Internet banks, air-traffic control systems, security systems, and so forth. In some cases, telecoms operators provide these services, but not always.

This division can be presented in a layered fashion, as in Figure 4-5. The figure illustrates how a user of a telecommunications network who is reading material on a web medium uses separate units of the network. The user employs a browser to connect to an Internet Service Provider (ISP) via an ADSL circuit connected to a copper local loop. Traffic control takes place in the central station, and the data flow to or from the media is routed there. The media are connected via fibre-optic cable to the access circuit in question. Each party also has the equipment to present or view information, equipment which ensures suitable data speed, etc. A similar description applies to calling from a voice phone, except that the user has one device or a central station performing equivalent processes.

The ownership of separate units of telecommunication systems has changed in recent years. Nowadays, a telecommunications operator is not particularly likely to own equipment at the user's premise other than the cable extending to it. The operator usually has equipment at

¹² An IP address is a unique Internet Protocol address identifying the sender and recipient of data sent in packet via the Internet or other networks using the Internet Protocol.

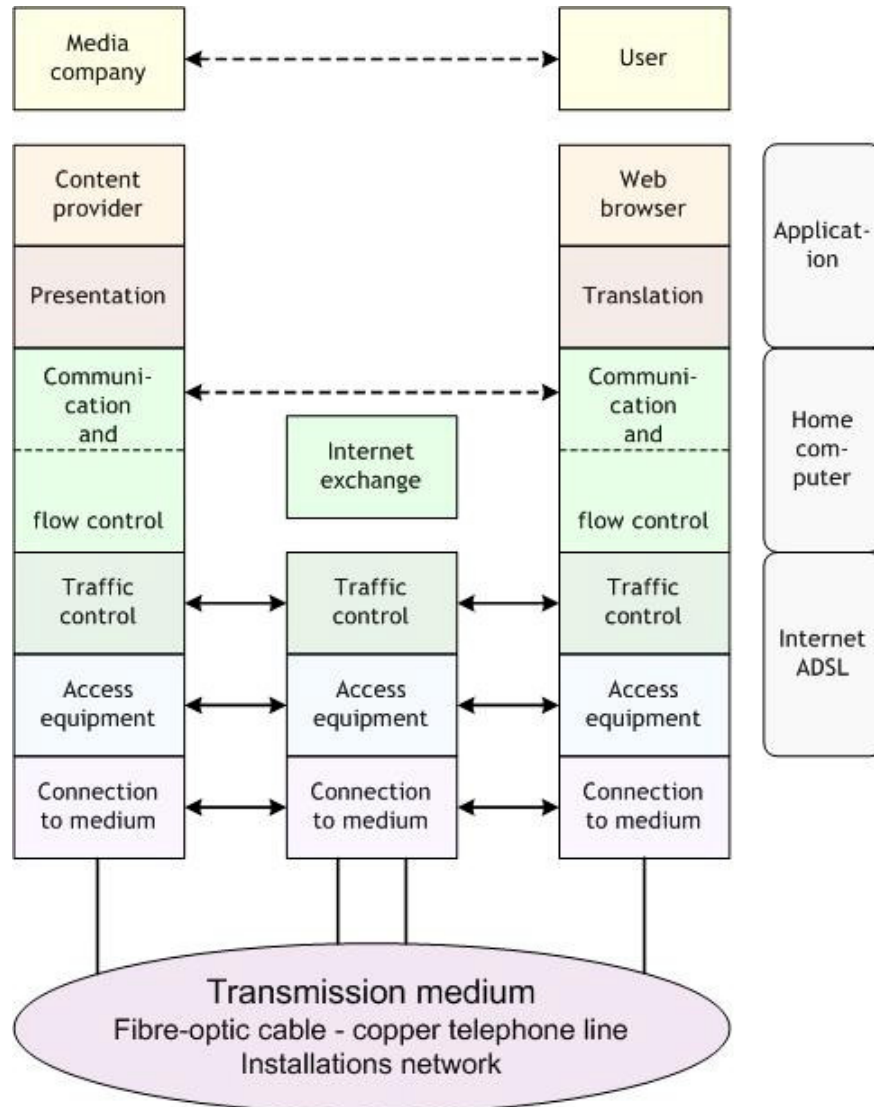


Figure 4-5 Layering of the telecommunications network

larger users' premises, but not always. The user then owns or rents equipment located at its premises.

Operators also provide extensive hosting services, for which they use facilities originally intended for telecoms equipment. Iceland Telecom offers hosting services at its Ármúli facilities in Reykjavík, as does its subsidiary Anza hf. Larger hosting service providers have connections to the telecommunication systems of all of the operators, as the clients of hosting companies may need to connect to various operators.

4.8 Aspects of systems segregation

The services provided by telecommunications operators are based on the units of telecommunication systems discussed above. Telecommunications units, other service units,

know-how and customer services are combined to form an interesting and useful service. The service provided by Iceland Telecom to the general public and businesses falls mainly into three categories: voice telephony, mobile telephony and data transmission. There is considerable overlap between these three types of service. For example, mobile telephones can be used for data transmission, and data transmission services can be used for voice telephony. Support services is the part of the service not belonging to individual telecommunications units, but is still an integral part of the business. Support services include directory services, billing systems, customer service centres and retail outlets.

Iceland Telecom provides other operators with access to individual units of its telecommunications network, which thus become a separate service. This can include rental of access to copper local loops, trunk lines, interconnection between switching centres or access to facilities. Other operators can provide services based on the units discussed above. Service is bought from Iceland Telecom, on top of which value-adding services are added.

The core telecommunications units thus shared by various operators have been referred to as the “Basic Grid” of telecommunications. However, the definition and demarcation of such a Basic Grid is not obvious. The discussion that follows focuses on different ways of delimiting and defining these core aspects from different aspects of the units of telecommunications services.

4.8.1 Horizontal basic aspects and vertical service aspects

One way of describing telecommunications services is to divide them into horizontal aspects in the form of platforms and vertical aspects arranged on top of the horizontal ones, thus forming a competitive environment for the supply of value-adding telecommunications services.

Figure 4-6 shows how services are divided into horizontal services provided, on the one hand, within specific “layers” and, on the other hand, vertical services supplied across several or all of the layers.

Iceland Telecom provides services in nearly all areas or layers and, accordingly, vertical services. Og Vodafone provides mobile services primarily through its own distribution system, but fixed-line services through units operated by other parties, which are categorised here as basic units. IT services and hosting operators offer services based largely on telecommunications, which they buy from the telecommunications operators, as their own home territory is higher up in the value chain. Media operators such as the RUV own their part of the broadcasting and distribution system, but usually not underground installations. However, they own substantial microwave connection facilities and, naturally, vast numbers of transmitters, thus reaching down into basic services. This shows that horizontal competition exists in all layers where the number of service providers exceeds one.

However, layering of this type does by no means apply in all instances. There can be substantial overlap between layers by technology and equipment. Thus, the same box may contain routing, interconnection and even the local loop to the user.

4.8.2 Value chain

Looking at telecommunications services as a value chain, the Basic Grid of telecommunications corresponds to wholesale of basic components to those offering products (telecommunications services) at the retail level to consumers – businesses and individuals. In a value chain, the division of revenue between parties can be assessed, and it enables regulating and ensuring that all telecommunications service providers have equal access to the Grid components.

4.8.3 Layering of telecommunications services

No definition exists of what constitutes the Basic Grid and what rests on top of it. Neither is there a definition of where or how it would be possible to connect to the Basic Grid, nor what service the Grid should or could provide. In other countries, the term infrastructure is sometimes used to refer to the basic architecture of telecommunication systems. The Icelandic equivalent of this term could be used in Iceland. However, views differ on how to define such a basic infrastructure. Below are a number of definitions illustrating the different viewpoints

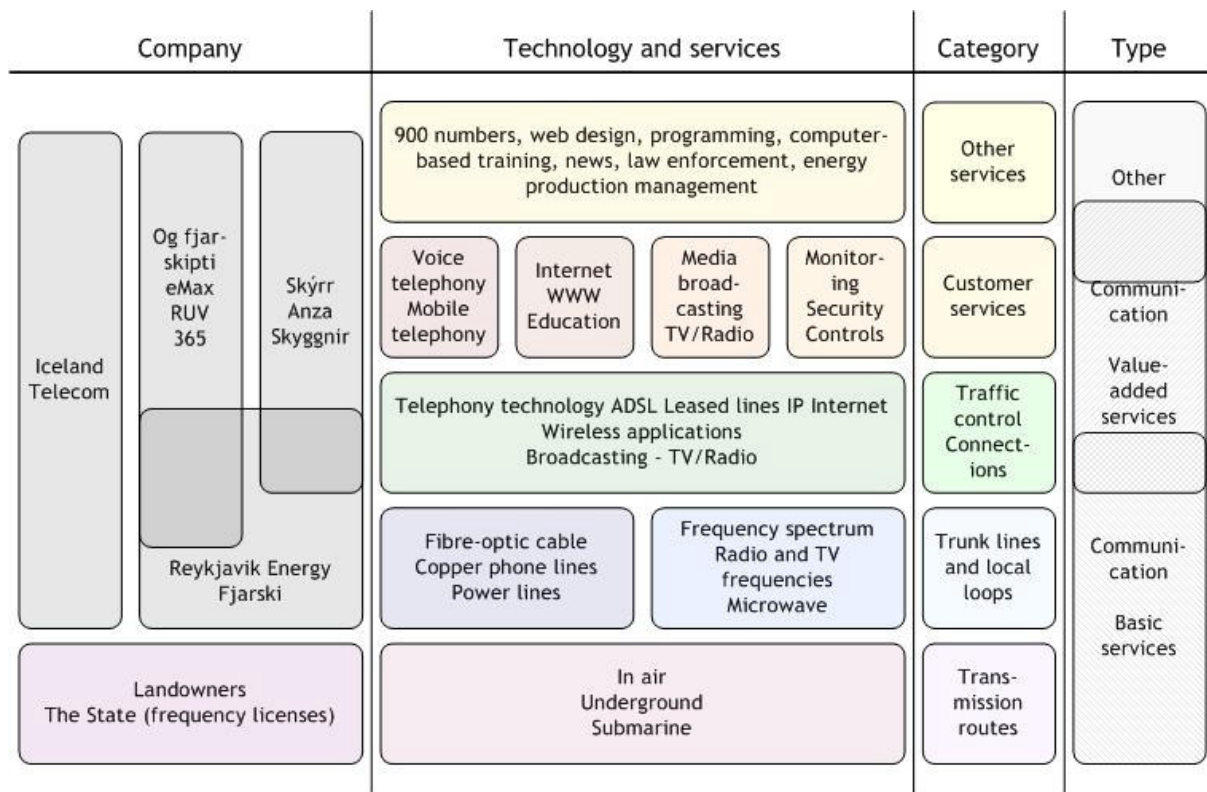


Figure 4-6 Layering of telecommunications services

on what the Grid does or should constitute:

1. The Grid is telecommunications infrastructure on top of which value-adding telecommunications services are built, thus forming the basis for such services. The

Grid includes all the units that others can use to prepare and supply telecommunications services. Looking at the units listed above, in effect all telecommunications equipment could thus belong to the Grid.

2. The Grid is a service that telecommunications service providers buy wholesale and sell retail at some value-added level. This does not focus on specific equipment or systems but certain services sold wholesale by a given party. Looking at the services provided by Iceland Telecom as a frame of reference, the company sells access to various kinds of services in most fields. The phrase *virtual service* is sometimes used for this perspective. Thus, voice telephone services can be re-sold, which enables those wishing to offer such a service to do so without having to buy telephone exchanges. Iceland Telecom has a separate department, *Network*, which provides a part of this service, both to internal (i.e. other Iceland Telecom departments) and external customers.
3. The Grid includes only what falls under underground installations and facilities that can be regarded as durable assets, i.e. which have a long useful life but are cost-intensive to develop. The part of the connection equipment that simplifies connections with the installations network or enables sharing of installations may be included. This is sometimes referred to as the *fixed network*. This entails listing the equipment representing substantial investments and which may be expected to deliver business benefits over a long-term period, or equipment whose installation requires much dislocation. In addition, equipment or facilities that need to be limited, such as masts, are included. This is the part that most people seem to agree should at least be included in the Grid.
4. The Grid is the network or product in which no competition exists, or the units of telecommunication systems of which one party owns the majority, and thereby has market dominance. This party should, therefore, provide others with access to this network in order to balance competitive conditions or stimulate competition. In the same manner, limited resources, such as frequencies, could be said to belong to the Grid. Frequency licences can stipulate conditions for other parties' access. In Iceland, obligations have been imposed on dominant undertakings to grant other parties access to their systems. For example, Iceland Telecom is required to meet various such obligations. The company must enter into interconnection agreements facilitating others to provide telephony services and provide access to local loops and facilities and various other network components.
5. The Grid consists of the units falling under universal service as defined in Icelandic law and EC Directives. Universal service is a basic service level, which the State is under obligation to ensure is available to all. In Iceland, equalisation fees are levied on telecommunications operators in order to fund universal service or its more onerous parts. All equalisation fee revenues are currently used to fund the Emergency Hotline. As a dominant undertaking, Iceland Telecom is under obligation to provide most of the following services:
 - Access to public pay telephones
 - Access to emergency services

- Answering of emergency calls
- Access to the telephone directory
- Data transmission services with a capacity of 128 Kb/s²
- Manual service
- Voice telephony services via the fixed network, including international calls
- A directory enquiry service
- Service to the disabled and users with special social needs

When these definitions are examined, it becomes clear that what parts are included in the Grid depends entirely on the criteria used. In addition, some telecommunication systems in Iceland do not necessarily fall under the above definitions, but are still regarded as basic services. One example is the RUV broadcasting network, which can without doubt be categorised as a telecommunications network. Its radio broadcasts are transmitted partly via Iceland Telecom's network and partly via RUV's network. Among other things, facilities, buildings and masts owned by RUV are used. The broadcasting system extends to all parts of the country, and there is hardly a spot to be found where RUV's signal cannot be received. The broadcasting network can be categorised as a type of public grid, and it can even be divided from RUV's services and combined in an independent basic-services company to which all media operators have equal access.

Reykjavik Energy (RE) is installing a new network based on fibre-optic cables extending to end users. The working name of the network is 4U, meaning the fourth utility. The network is based on the EAMAN concept (Equal Access Metropolitan Access Network). Every home and business will be connected to the network, and to begin with there will be a switching centre in the nearest electricity transformer station. RE will not provide any services other than the basic connection service, and will offer to service providers to supply their services through this network. RE's basic connection service is unusual in that it assumes that RE will provide fibre-optic cables together with all active terminal equipment and switching technology for traffic control and separation. RE's basic service is thus an IP connection and, in effect, more than that, as RE performs the separation and prioritising of all IP routing. RE will also run a website where customers can buy all services unassisted. Service providers will need to connect their internal business systems to RE's service network in order to offer services to residential and corporate customers.

This illustrates that there is no one simple definition of the Grid, and the views of Icelandic telecommunications parties vary substantially.

4.9 Assessment of segregation

4.9.1 Other countries as a frame of reference

The privatisation of telecommunications companies in other countries has not entailed separating from them the operations or systems that can be regarded as part of the Basic Grid

or basic services. In order to prevent a monopoly situation, the methods used have been, rather, to retain a controlling stake in the company, or to impose stringent rules with which it must comply. To this end, regulatory authorities have been strengthened in order to ensure compliance with rules and non-discrimination requirements. However, there are examples of dividing up telecommunications companies, such as in the US, where a dominant undertaking (AT&T) was split 25 years ago into a number of smaller companies providing, on the one hand, local services (Baby Bells) and, on the other hand, trunk-line services, which remained in the hands of AT&T. In January 2005, the sale of AT&T to a company mostly operating locally was finalised. Recently, discussions took place, for example in the US Congress, that the new local operators should be divided into wholesale companies on the one hand and retail companies on the other hand. This has yet not happened, as it is found both unworkable and unnecessary, because the same objectives could be achieved through restructuring of operations and regulations.

Although companies have not been split up in privatisation as regards basic services, there has been talk in a number of countries that this needs to happen, or at least that certain services or networks need to be more clearly delimited from other activities. This applies particularly where competition has not developed sufficiently in the opinion of government authorities or others. This discussion has for example taken place in the UK, the Netherlands, Austria and Australia. It still has not ended, and probably will not in the foreseeable future. But such a split-up has not happened, and there are no discernible signs that it will. On the other hand, rules on the telecommunications activities of dominant undertakings as well as competition rules have been tightened, and measurable performance targets have been set regarding what to achieve and when. In some countries, there are different types of public-owned companies, such as railway operators, that offer telecommunications services, but have not been sold although telecommunications companies have been privatised.

During the sale of telecommunications companies, measures have always been taken to retain a separation between, on the one hand, government and regulatory activities and, on the other hand, telecommunications operations. Rather than splitting the companies up by type of service or telecommunications units, an effort has been made to remove the part of the operations regarded as having government or regulatory functions.

4.9.2 Separation

Various activities that were previously part of Iceland Telecom's operations have now been separated from the company. Examples include most indoor installations, in accordance with a clearer definition of local telephone loops, the sale of larger switching systems and specialised aeronautical and maritime telecommunications. A large-scale split also occurred when postal services were separated from telecommunications services.

As mentioned above, a section of basic-grid services was separated from other operations in a special department, Network, with a separate board controlling fee collection. This separation could be called horizontal, because a particular basic service, which was part of wholesale operations, was put to one side and separated within the company from other competitive activities.

Separation can take many forms, including technical, operational or financial. It can be based on, for example, the following criteria:

- Internal separation:
 - Accounting separation by operations or departments

- External separation:
 - Geographical separation
 - Long-distance line services separated from local services
 - Trunk lines or local loops separated from other operations
 - Mobile telephony or wireless services separated from fixed-line services
 - Horizontal separation of units in the same layer

Internal separation refers to dividing intra-company operations, i.e. without forming independent companies. External separation refers to splitting Iceland Telecom into two or more independent companies. During privatisation, the companies intended for sale would be sold separately.

Iceland Telecom already has substantial accounting separation in place in accordance with laws and rules. There is also wider-scope separation, designed to, among other things, obtain a thorough overview of the performance of individual profit centres. In addition, separation by operations and departments is in place.

Geographical separation hardly applies in Iceland, but exists in other countries. In many countries, telecommunications companies provide local services restricted to a particular region or local authority. If this were the case in Iceland, Iceland Telecom would be split by Iceland's four main regions, or into urban and rural services.

Long-distance line service is based on trunk lines, equipment connected to them and various facilities. International connections and the transmission of calls or other telecommunications signals between places could also be regarded as long-line services. If long-distance line services are separated from other components, each time a telecommunications signal travels between separately defined regions it will also travel between telecommunications companies. For Iceland Telecom, this would primarily entail the separation of the fibre-optic network and equipment connected to it from Iceland Telecom, but possibly also the switching stations of the voice and mobile telephony network as well as data switching centres.

Separating local loops from other operations entails transferring copper and other local loops as well as their accessories to a separate company. Iceland Telecom is already under obligation to provide access to copper local loops on non-discriminatory terms. Other telecommunications companies already use copper local loops extensively, both through shared access by two parties and full access where one telecommunications company has full use of the local loop for its customers. A new company owning copper local loops would presumably be subject to universal service obligations, and would compete with other operators owning local loops or offering local-loop services.

Wireless services are technically of a different type from fixed-line services. This would enable separation of units belonging to mobile telephony services from other units. On the other hand, the mobile telephony network is based on other telecommunications units, in particular trunk lines and facilities. Iceland Telecom's mobile telephony services are subject to the obligation of providing roaming services, which would presumably remain with a separated company offering wireless services.

Horizontal separation would mean that the units in an equivalent service layer would be transferred to a separate company. All trunk lines and local loops, for example, would then be transferred to a separate company, regardless of their technology and use, whether copper local loops, coaxial systems, optical fibre or wireless connections. The same would apply to connection equipment and facilities.

Whatever the method used, the cost of external separation would clearly be substantial, while the benefit, on the other hand, would be uncertain. The company's split-up would be problematic because its equipment and systems are very intertwined after 100 years of operations. A new basic-grid company would be subject to the same rules as apply to Iceland Telecom at present. Nonetheless, after the Grid's split-up, Iceland Telecom would be subject to the rules applying to dominant undertakings.

If the components that could be regarded as part of the Basic Grid were to be separated from Iceland Telecom, in accordance with any of the definitions discussed above, to establish a separate company for these components, this company would not be granted a monopoly on basic-grid services. It would presumably have a dominant position, at least at first, and as such be subject to certain obligations. Other parties could develop a new basic grid in parallel to this Grid. Obligations and rules that would have to be imposed on such a Basic Grid company would lessen its chances of meeting competition and sap its power for further development.

Iceland Telecom does not have a monopoly on any operations, and nobody does in the telecommunications market. On the other hand, Iceland Telecom could be said to have a monopoly position in certain areas on the strength of its size. Iceland Telecom is required to keep separate accounts between its dominant operations and other activities, and provide others with access to them on non-discriminatory terms. It is under obligation to have its wholesale service tariffs approved by the Post and Telecom Administration and submit cost accounts for such operations. Iceland Telecom must also provide certain universal services. Therefore, separating monopoly operations from competitive activities is not for discussion. Universal service, where applicable, can hardly be separated from Iceland Telecom.

4.9.3 Owners of basic grid services

Figure 4-6 shows that a number of companies, in addition to Iceland Telecom, run telecommunications units that can be regarded as part of the Grid.

4.9.3.1 Reykjavik Energy

Reykjavik Energy (RE) presently owns substantial telecommunication systems. RE plans to expand these networks considerably in the next few years through developing a fibre-optic network and other networks. They are intended for all service providers interested in

supplying a wide range of value-adding services on the basis of RE's infrastructures. RE has entered into an agreement with the local authorities of Seltjarnarnes and Akranes on developing a fibre-optic network connecting all homes to the network. Thus, competition between local authorities for the services that can be provided to their inhabitants can be said to have started. RE's plans envisage that, within the next 3-4 years, most homes in its service area will have been connected to its network. The service area currently extends from the Borgarfjörður bay area in west Iceland to Hvolsvöllur town in south Iceland. In addition, the City Council of Reykjavík has assigned the Mayor with the task of negotiating with RE on expediting the fibre-optic network's development.¹³

The foundation of RE's fibre-optic network was built when the data transmission company Lína.net launched its operations and built a network interconnecting most transformer stations in the capital city area through fibre-optic cables. RE bought this investment in 2002 from Lína.net, and this asset forms the basis of RE's current plans for residential fibre-optic connections. The Fourth Utility, or 4U, is the name of RE's project for connecting all homes in the Reykjavík area to the fibre-optic network through the nearest transformer station.

RE offers to service providers to connect to the network in order to sell their services to prospective clients. RE does not intend to sell any value-adding services itself, leaving that aspect entirely to service providers. The company's definition of basic services is unusual, and includes the following components:

- Fibre-optic cables
- Users' terminal equipment
- All switching equipment in distribution centres
- All control systems in centres
- All routing and distribution control
- Technical surveillance of service level
- Users' self-service interface
- Connections between service control and service provider.

As evident from the above, defining the Fourth Utility is an extensive undertaking. Clearly, RE will need to invest in much equipment and control systems to meet this definition. The deciding factor for succeeding, in the opinion of RE, is the speed at which the fibre-optic connections themselves are spread.

The technical development of the fibre-optic network primarily concerns installing fibre-optic connections from each building to the nearest transformer station. This factor is determined by the distance and the type of optical fibre used; in most cases, it will be single-mode, although multi-mode fibre will be used for some shorter distances. The first connection point will be at the nearest transformer station, so active equipment will be installed in all of RE's

¹³ Reykjavík City Council, February 10th 2005.

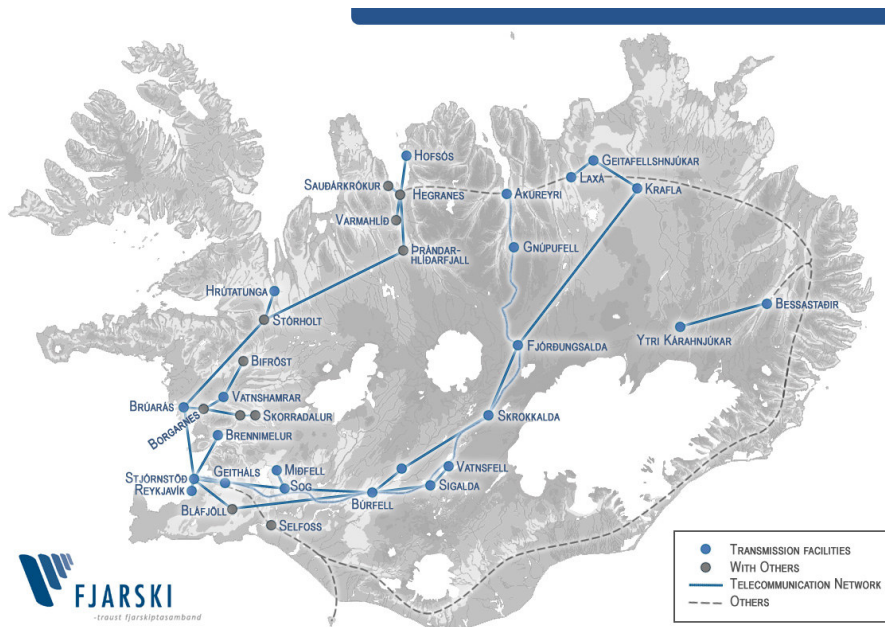


Figure 4-7 Fjarski's telecommunication systems

transformer stations. Transformer stations will be interconnected through active equipment and form a distribution network. The distribution network will in turn be connected to a core network, where all main traffic control takes place.

A large part of the network is the necessary control systems needed to control routing and service supply. RE will provide these control systems as part of its basic services.

4.9.3.2 Og Vodafone

Og Vodafone operates its own telecommunications network both for fixed-line and mobile telephony services. A co-operation agreement was concluded in November 2004 between RE and Og Vodafone, concurrently with Og Vodafone taking over all operations of Lína.net. Under the agreement, RE will take over all operations and development of Og Vodafone's fibre-optic network, and Og Vodafone will handle sales and marketing.

Og Vodafone owns telecommunication connections but also leases lines from Iceland Telecom, Fjarski, RE and others.

Og Vodafone's mobile telephony network is based on GSM cells, which have been installed in the company's distribution area. Its current distribution area covers the entire Reykjavík area and other main urban areas. In total, the network covers approximately 90% of Icelanders, and outside its coverage the company has a roaming agreement with Iceland Telecom. The interconnections of GSM cells vary, and include the company's own microwave connections, fibre-optic connections through RE's fibre-optic network and leased-line connections from Iceland Telecom.

4.9.3.3 Fjarski

Fjarski ehf. was established in October 2000, and is owned by Landsvirkjun (The National Power Company) and Iceland Telecom. Fjarski took over the telecommunications network operated by Landsvirkjun for years for remote control of its power stations and telecommunications in the highlands. The purpose of founding Fjarski was to expand these operations and better utilise the transmission capacity of fibre-optic and microwave networks, as well as to

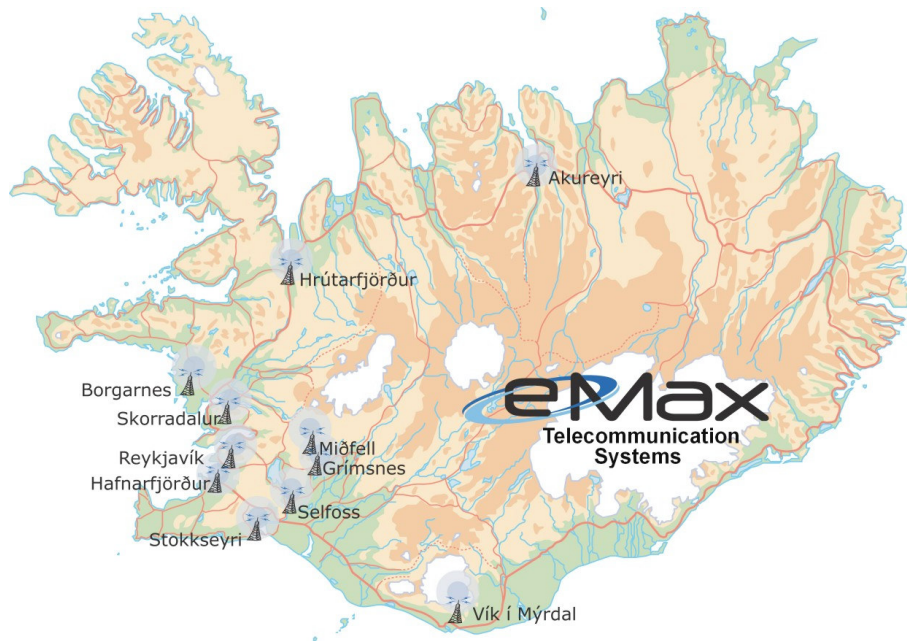


Figure 4-8 eMax's telecommunication systems

sell telecommunications services to other businesses. Fjarski's telecommunications services consist of, first, the sale of bandwidth and, second, the sale of telecommunications facilities or collocation, as Fjarski runs telecommunications centres in many parts of Iceland.

Fjarski's telecommunications network extends to many parts of the country, as illustrated by Figure 4-7.

4.9.3.4 eMax

eMax operates wireless Internet connections to corporate and residential customers in many parts of the country. The company has developed an ambitious distribution network in a short period, focusing on regions outside the Reykjavík area. The company's distribution network extends over a wide area, as shown below in Figure 4-8.

4.9.3.5 Other market players

Various parties operate basic telecommunications infrastructure, and in various ways. According to data from the Post and Telecom Administration, a total of 56 telecommunications enterprises are registered.

RUV and Og Vodafone (or its related companies) own substantial assets relating to TV broadcasting.

Local fibre-optic or cable networks have been installed in a number of places, including the towns of Keflavík, Sauðárkrókur and Akureyri and the Westman Islands.

Most of the parties that provide Internet services in Iceland connect through a shared exchange named RIX (Reykjavík Internet Exchange). RIX is the exchange for Icelandic Internet service providers, which prevents domestic traffic from flowing through international connections. This exchange is operated by Internet á Íslandi ehf. Its shareholders number 25, the largest of which is Og Vodafone. The exchange can be regarded as a basic-grid service, as its service is sold at nearly cost price and any party is allowed access to it. Iceland Telecom is one of the parties connected to the exchange.

4.10 Opinion

The above discussion has centred on the technical architecture of telecommunication systems, different viewpoints on the Basic Grid's definition and the categorisation of services as well as ways of separating them. Various arguments have been voiced by many, recommending either dividing up Iceland Telecom and selling it in parts or selling it as one whole entity. The following is a review of various arguments for and against these proposals.

It is in most parties' best interests that the highest possible price is achieved for Iceland Telecom. Dividing up the Basic Grid will delay the sale, as the segregation would clearly take a long time. It is necessary to achieve a conclusion satisfactory to as many parties as possible regarding the definition of what the Basic Grid includes, and implementing a technical separation would be complex. It would increase uncertainty regarding Iceland Telecom's sale, and undoubtedly weaken interest among investors, thereby reducing Iceland Telecom's selling price – the proceeds of which could partly be used for the development of telecommunications in sparsely populated areas. The current market conditions appear conducive to achieving a favourable price. This is unlikely to be the case in a few years, if the sale is delayed owing to a segregation process.

Selling Iceland Telecom as one whole entity is quite certain to draw a higher price. Thus, the State will have more funds to develop telecommunications services in areas where telecommunications operators see no benefit in development on market grounds. The assumption can be made that numerous parties would be interested in tendering for such development, and invitations to tender can be arranged in a manner ensuring favourable bids.

If it is a universal service, shortage of development or service can be remedied through a contribution from the Price Equalisation Fund. In addition, the Minister of Communications may, under telecommunications law, establish a "special" telecommunications service. The Minister may request that undertakings, operations or services are carried out for the public good, for security reasons, or due to environmental considerations or regional interests, which may be expected to be unprofitable although not defined as universal services. In such cases, the Post and Telecom Administration is entrusted with concluding a contract with a telecommunications undertaking following a competitive selection procedure. Costs from such measures are, as a rule, paid by the Treasury.

It has been maintained that a new private company operating the Basic Grid could discontinue all development of the Grid except where profitable. It has also been argued that a new private company could add to the Grid's development where convenient for it, precisely in order to maintain an advantage and gain possibilities of offering new and innovative services on top of the Grid, such as TV broadcasts over ADSL. If a new owner finds that, despite this, there are not sufficient business grounds to continue operating or further developing the Basic Grid in certain places, it needs to be assessed whether the service is of a nature invoking the State's obligation to strengthen and support it. If so, the above equalisation measures can be applied and special funds can be allocated to improving the service in question.

The telecommunications network units that can be regarded as part of Grid networks are usually expensive to purchase or build, but have a long useful life and are relatively inexpensive to operate. As a result, Iceland Telecom's new owner is unlikely to reduce their use by trimming down the supply of Grid services in rural areas. A Grid operator needs, due to the nature of the matter, to invest in continued technological development, and to meet rapid product development and growing customer demands. Mounting demand for value-adding services increases the Grid's use, and thereby induces its continued development across the country. Separating the Grid from other operations can, in point of fact, reduce this inducement for further development.

Telecommunications operators have been merging lately. This seems to indicate that telecommunications companies need certain scale and strength for their operations to be cost-effective and return satisfactory earnings to its owners. In light of this, the assumption may be made that a Grid company, the scale of which might be less than one-fourth of Iceland Telecom, would face difficulty in its operations. If Grid services were separated from Iceland Telecom, the company would remain strong, be free of the obligations that come with Grid operations and enjoy more freedom in other activities.

On competition grounds, profits from one dominant business entity cannot be used to compensate other operations, regardless of ownership. If any basic-grid business regarded as necessary operates at a loss, presumably because demand for the service is insufficient or pricing is too low, external measures to remedy this are needed anyhow. This applies regardless of whether the service is provided by Iceland Telecom – owned by new parties – or a new basic-services company.

Telecommunications companies already operate in a demanding environment characterised by a large number of encumbering regulations. If a new company were established for Basic Grid operations, it would also be subject to many obligations, of which Iceland Telecom would thereby be discharged. No synergies would be achieved in the operations of support units, central management, facilities or other operating aspects, as is currently the case, and the operation of basic services could be expected to end up more cost-intensive than at present. It is even more unlikely that the new company would have the capacity to maintain and continue the development of its own telecommunications network, and buyers of its service would have to pay a higher price.

The legal framework in Iceland and elsewhere in Europe should ensure for Iceland Telecom's competitors easy and equal access to Basic Grid services. The current Icelandic telecommunications legislation, dating from 2003, imposes obligations on a dominant undertaking in the telecommunications market (universal service obligation) and stipulates

access for other operators to the telecommunications network of such a party. In the event that a violation by the dominant undertaking is discovered, the Post and Telecom Administration and the Competition Authority can take measures to intervene. Criticisms have been made against the time it takes to come to a conclusion after a complaint is filed to these regulatory authorities, as well as against it taking Iceland Telecom longer to process its competitors' orders than its own. This can be solved with relatively simple measures, procedures and measurable criteria, imposing penalties in cases of non-compliance.

Since the Post and Telecom Administration was established on 1 April 1997, massive changes have taken place in the operating environment for telecommunications, including the repeal of the State monopoly on telecommunications services and networks in 1998. Since then, the telecommunications market has naturally changed, as has its legal framework. Strides have been made in improving the regulatory framework in order to stimulate competition, ensure non-discrimination and streamline the dispute settlement process. By the same token, measures must be taken to ensure that the legal framework does not stifle business and continued development. The telecommunications legislation passed in 2003 clarified the operating environment of telecommunications companies and regulators. Therefore, fewer disputes are expected to arise in the near future, and the time it takes to settle them is likely to be shortened. In fact, complaints filed against Iceland Telecom that have come under the regulation of the Post and Telecom Administration have usually concerned service aspects other than the operation of and access to the Basic Grid.

Iceland Telecom's competitors in the telecommunications market have maintained that a company having control of a Basic Grid can deny its competitors access to the Grid, price them out of the market or receive delicate information regarding market plans and respond in some way. They argue that, therefore, the Basic Grid should be separated on competition grounds. If this is correct, the Post and Telecom Administration and the Competition Authority have powers at their disposal, laid down in law, to intervene and impose penalties. These regulators can demand any information necessary in their opinion to investigate cases. In addition, Iceland Telecom is under obligation to keep separate accounts for its wholesale operations, and to sell Grid services to its own operations at the same price as to other telecommunications companies. The pricing of these services shall be based on the cost price plus a reasonable margin. There is nothing to indicate non-compliance with these requirements, and the Post and Telecom Administration has repeatedly scrutinised information from Iceland Telecom in this respect.

The possibility has been pointed out of merging the basic grids of Iceland Telecom, Reykjavik Energy, Og fjarskipti, Fjarski, RUV, Farice and other market players into one national grid to be owned by the State and local authorities or others. This would create one relatively large and strong company that could be open to all parties. However, the EEA regulatory framework envisages competition in the operation of Basic Grids, as in other areas of telecommunications. A State-run Grid would, thus, compete directly with other operators. The State-run Grid could, for example, be subject to obligations regarding development at a national level, with no profit requirement. The company would be banned from receiving any Government subsidies. Whether such a structure would comply with the provisions of the EEA Agreement is debatable. The opposite applies to electricity transmission, which European legislation envisages as a monopoly. Ensuring that telecommunications companies became customers of such a Grid would be impossible, even for the remaining business of Iceland Telecom. Any company, including Iceland Telecom, could at any given time start

developing another grid, if the conditions were right or if advantageous in light of technological developments. Whether a party wishing to, for example, develop a wireless basic grid based on the latest technology had any chance of competing with the new Basic Grid company is another matter.

In most parts of Europe, telecommunications enterprises have been sold from State ownership in part or in whole. In this process, basic grids or basic services have not been separated from the telecommunications companies. This has been seen as unnecessary, not workable or cost-effective or simply not a matter for discussion. In fact, this is not known to have been done anywhere, which raises the question why this should be done in Iceland and whether Icelandic conditions are so different from those in neighbouring countries. The argument has been made that, had the effects of privatisation in other countries been known beforehand, their basic grids would not have been included in the sale. This appears to apply particularly where privatisation started rather early and was extensive, for example through the sale of all shares. In such cases, the operating framework and regulatory authorities appear not to have adapted to changes, thereby precluding remedies to intervene. In many cases, a remedy has been effected since to some extent. Nonetheless, various lessons can be drawn from these examples regarding what is needed for a successful privatisation.

Iceland Telecom is under obligation to provide GSM roaming services to other telecommunications companies, which gives Og Vodafone and other parties access to Iceland Telecom's distribution network. Therefore, Og Vodafone and other companies do not need to develop networks across the entire country, which renders the GSM distribution network in rural areas, in a sense, a grid network or service. The same applies to access to the exchange network. Therefore, it would be a reasonable requirement for exchange and mobile telephony networks in areas other than the most densely populated to be regarded as part of the Grid if wholesale aspects were to be the deciding factor. If mobile and voice telephony services were separated from Iceland Telecom, the company would have to be split vertically in a very technologically complex manner, which would hardly be viable owing to the cost and enormity of such a task.

4.10.1 Conclusion

Horizontal separation of Iceland Telecom's Grid services from other operations is a substantial undertaking, which would be costly and cause much dislocation in a market that has been in turmoil for the past few years. The cost would be irretrievable and either borne by consumers, through higher tariffs for telecommunications services, or result in sluggish renewal and development of Grid infrastructure. Dividing the Grid may seem simple if consensus can be reached on what belongs to it. However, great uncertainty exists regarding the outcome and the results of segregation, many questions remain unanswered and there are no precedents to follow. Whether a segregation will lead to streamlining, a better competitive environment or step up development of Grid services in the future is unclear. But it is clear that the cost will be high.

The logical course to follow is to emphasise the current methodology of controlling and regulating the telecommunications market and the activities of telecommunications companies, as applies to other competing enterprises. This is consistent with other competitive markets in Iceland and the organisation of such aspects in our neighbouring countries. If control and regulation clearly need to be strengthened, it is important for this to

be done in conformity with EU legislation and directives. However, measures must be taken to ensure that regulatory bodies are equipped to respond to complaints in an effective manner so that a decision be available as soon as possible, as telecommunications technology changes frequently and telecommunications services develop rapidly.

5. The implementation of privatisation

The Executive Committee on Privatisation operates under a letter of official duty regulations dated 14 February 1996¹⁴ and is entrusted with its duties by the Ministerial Committee on Privatisation. During the past five years, 14 sales of State-owned shares have taken place, totalling approximately ISK 55 billion in sales value. The sale of Iceland Telecom, however, marks the largest single privatisation to date in Icelandic history.

5.1 General objectives of privatisation

The objectives of privatisation can be economical, political or financial. These different types of goals are not always compatible, and it is well-known that different countries have emphasised different objectives for the privatisation of State-owned enterprises. The goals of privatisation can also vary between different projects and periods in time. However, there is general consensus that the most important goal of privatising infrastructure, such as telecommunications companies, power companies and water utilities, is to ensure competition based on a solid legal framework and internal restructuring of the companies in question. This emphasis does not always return the highest revenue to the Treasury, but in the longer-term it is believed to deliver the most success in developing the markets in question.

Various additional goals have also been set in relation to the implementation of various privatisations. These goals have been formulated in separate legislation, parliamentary discussion, Government decisions or the decisions of individual Ministers. In addition, the Executive Committee on Privatisation has set general goals for privatisation projects. The main objectives of this type are:

1. To increase competition and efficiency in society. Market forces are generally more effective in the utilisation of production resources than government intervention.
2. To give the public and other investors in Iceland the opportunity to acquire stakes in State-owned companies.
3. To reduce political influence within companies. Experience shows that higher standards are set for management staff and they receive more stringent control from owners after privatisation.
4. To strengthen the stock market. A strong Icelandic stock market is very important for all Icelandic economic activity. Overheating of the economy can be curbed by encouraging the public to participate in business through buying shares.
5. To improve the Treasury's balance sheet. Through the sale of the State's shares, a substantial portion of the Treasury's debts can be paid, thereby reducing the interest burden in the future.
6. To improve consumer welfare. The streamlining achieved through privatisation is likely to step up competition, which will in turn increase consumer welfare.

¹⁴ See the website of the Executive Committee on Privatisation at www.forsaetisraduneyti.is/raduneyti/verkefni/Einkavaeding/nr/244

7. To strengthen the position of employees. Privatised companies have more possibilities than State enterprises to pay high salaries to good employees, including performance-linked salary structures and ensuring long-term occupation.
- 8.

Of course, the weight given to each of these objectives will depend on the project worked on at any given time. Some projects can embrace all of these goals, others a part of them. The Committee strives to base its proposals on these objectives.

5.2 Sale methods in the privatisation of State enterprises

Various methods can be used to sell State-owned shares. A common approach is to offer to the general public the opportunity to purchase the shares at a pre-determined price, allowing the buyers, usually individuals, to register for a limited amount. In such cases, the main goal is to spread ownership in the companies in question and encourage the public to buy shares. A condition for using this method is that the companies are limited liability companies.

Issue by tender is also a common method of privatising State-owned enterprises. Investors are asked to tender for the shares, which are then allocated to the highest bidders. This method can be convenient if the company in question operates in a very specialised or high-risk field. Issues by tender often provide the possibility of bidding for large shares, even the total share capital, in order to attract investors interested in participating directly in the company's operations. Limits may be set for the amount of shares for which one buyer can bid. Issues by tender can take the following forms:

- Open issue by tender: A prospectus is made available for bidders to be able to familiarise themselves with the company. All prospective buyers have the same access to prepare bids in accordance with the terms and conditions of the issue. Examples of such a privatisation method used in Iceland are the public offering of shares in Stofnfiskur hf. and Iceland Prime Contractors hf.
- Private placement: Following a pre-qualification procedure, a limited number of participants are invited to tender. They are provided with good access to information about the company, including meetings with management and board directors. The purpose of this method is to give those regarded as most suitable following pre-qualification an opportunity to familiarise themselves better with the company than in the case of an ordinary prospectus. The sale of State shares in Áburðarverksmiðjan hf. and of a majority holding in Skýrr hf. are examples of this method used in Iceland.

A sale to core investors can be through an open issue by tender, but more aspects are likely to be taken into account when selecting such an investor to buy shares in a company. This method has been used in many parts of Europe in the sale of shares in telecommunications companies, and there are even cases of shares to such parties being sold before the registration or actual offering of the shares has taken place. Examples of this include the Irish telecommunications company EirCom, Telecom Austria, Belgacom and TeleDenmark. This method is not least an indication that the general public and core investors wish to know who would hold a core position in the companies, their plans and future vision, before making a decision about their own investment. The share sold to core investors varies in size, but a common criterion is whether it is large enough for the party in question to have substantial

interest in the company's success and for ensuring its sufficient management control in the company. In the past few years, core investors have increasingly sought to invest in a very large (controlling) stake in telecommunications companies, and as a result they have been willing to pay a significantly higher price per share. The most recent examples of selling majority holdings in telecommunications companies to core investors include the intended sales of Turk Telecom in Turkey and Cesky Telecom in the Czech Republic.

5.3 Preparations for the privatisation of Iceland Telecom hf.

A Policy Statement of the Government includes the following:

“Companies operating in competitive markets have been privatised in recent years. Parliamentary authorisation for the sale of the State's share in Iceland Telecom will be followed through, taking care to arrange the sale under favourable market conditions to ensure that the Treasury obtains a fair price for this asset. Measures will be taken to ensure that current services to the public in this field are not compromised.”

The Executive Committee on Privatisation has over the past year prepared the sale of Iceland Telecom. In October 2004, bids were invited for consultancy services for, first, the sale of shares in Iceland Telecom and, second, the sale of a stake to a core investor, provided that such a sale would take place.

Following assessment of 14 bids from 18 Icelandic and foreign financial institutions and consultancy firms, in which price, services and bid quality were key factors, the Committee decided to enter negotiations with the respected financial services company Morgan Stanley in London. On 23 December 2004, the parties signed a contract on services in relation to the intended sale of State shares in Iceland Telecom.

In addition to Morgan Stanley, the following parties submitted bids for this part of the project:

- Carnegie and Verðbréfastofan
- Credit Suisse First Boston and Alfa
- Deloitte
- Deutsche Bank and MP Fjárfestingarbanki
- Ernst & Young
- Handelsbanken Capital Markets
- HSH Gudme
- JP Morgan and Íslandsbanki
- KPMG
- Landsbanki
- Lazard
- Lehman Brothers and Allied Partners
- Pricewaterhouse Coopers

5.4 Sale of shares in Iceland Telecom

The Executive Committee on Privatisation proposes that all State shares in Iceland Telecom be sold in a single lot one consortium of core investors. However, the Committee proposes that such a sale to a core investor be subject to the following conditions:

- a) no single party, related or connected parties shall acquire a share in Iceland Telecom, or a company established for the purchase of the State's share in Iceland Telecom, larger than 45%, directly or indirectly, until the company's listing on the Main List of the Iceland Stock Exchange.
- b) a specified portion of the purchased shares, and no less than 30% of the company's total share capital, shall be offered by the buyer to the general public and other investors for purchase before year-end 2007, and the sale of shares in the company to other parties shall not take place until such a sale is complete.
- c) Iceland Telecom shall be listed on the Main List of the Iceland Stock Exchange (ICEX), in accordance with the conditions of ICEX, concurrently with the sale to the public and other investors, and redemption rights shall not be exercised vis-à-vis current shareholders in Iceland Telecom (1,2 %) until the listing of the company on the ICEX Main List.
- d) the core investor shall not have direct or indirect holdings in companies competing with Iceland Telecom in Iceland.

The assessment of bids will be based on, *inter alia*, price, financial strength and financing plans, experience of business operations and ideas and future vision regarding Iceland Telecom's operations, its employees and services in urban and rural areas during the next five years and other relevant factors.

Sale in a single lot to one consortium of core investors is designed to achieve the best possible outcome for the Treasury. This way, it is expected that the most favorable conditions are created to attract investors and promote competition, which, in turn, generates the highest price.

5.5 Sale methodology

It is expected that the sale will be completed in July. All interested parties, who have the capability, sufficient experience and financial strength to complete the transaction will be considered as potential buyers.

Information on the sale process will be given periodically, however, certain information regarding the process will remain confidential and withheld to maintain competitive conditions.

The Executive Committee on Privatisation reserves the right to deny all bids. The final decision will be made by the Ministerial Committee on Privatisation.

5.6 The objective of privatising Iceland Telecom

The Executive Committee on Privatisation believes that implementing the above proposal will achieve various general and specific objectives regarding the sale of State assets, and that this sale arrangement is consistent with the Government's Policy Statement as well as the Committee's standard operating procedures.

The objectives are as follows:

- a) to achieve the highest price possible for the State's share, thereby further strengthening the Treasury's position;
- b) for the company to continue to be operated as an independent Icelandic company registered in Iceland;
- c) for the company to continue to be a strong service provider contributing to increased competition and efficiency in the telecommunications market;
- d) for the company to continue to maintain a service level in telecommunications in urban and rural areas comparable to the one it currently provides, including normal maintenance and renewal of structures;
- e) to strengthen the Icelandic stock market by listing the company on the Main List of the Iceland Stock Exchange before year-end 2007, and again providing the general public and other investors with the option of acquiring not less than a 30% share in the company before the end of the year 2007.

